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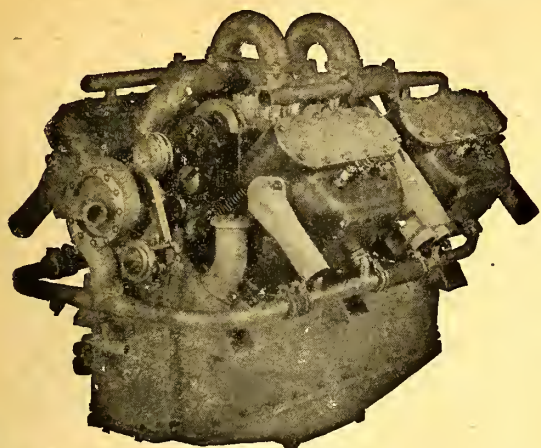
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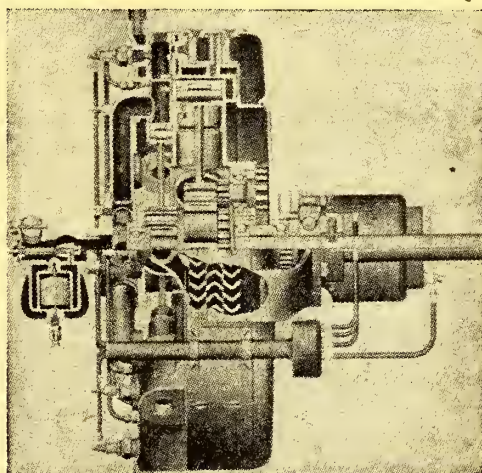
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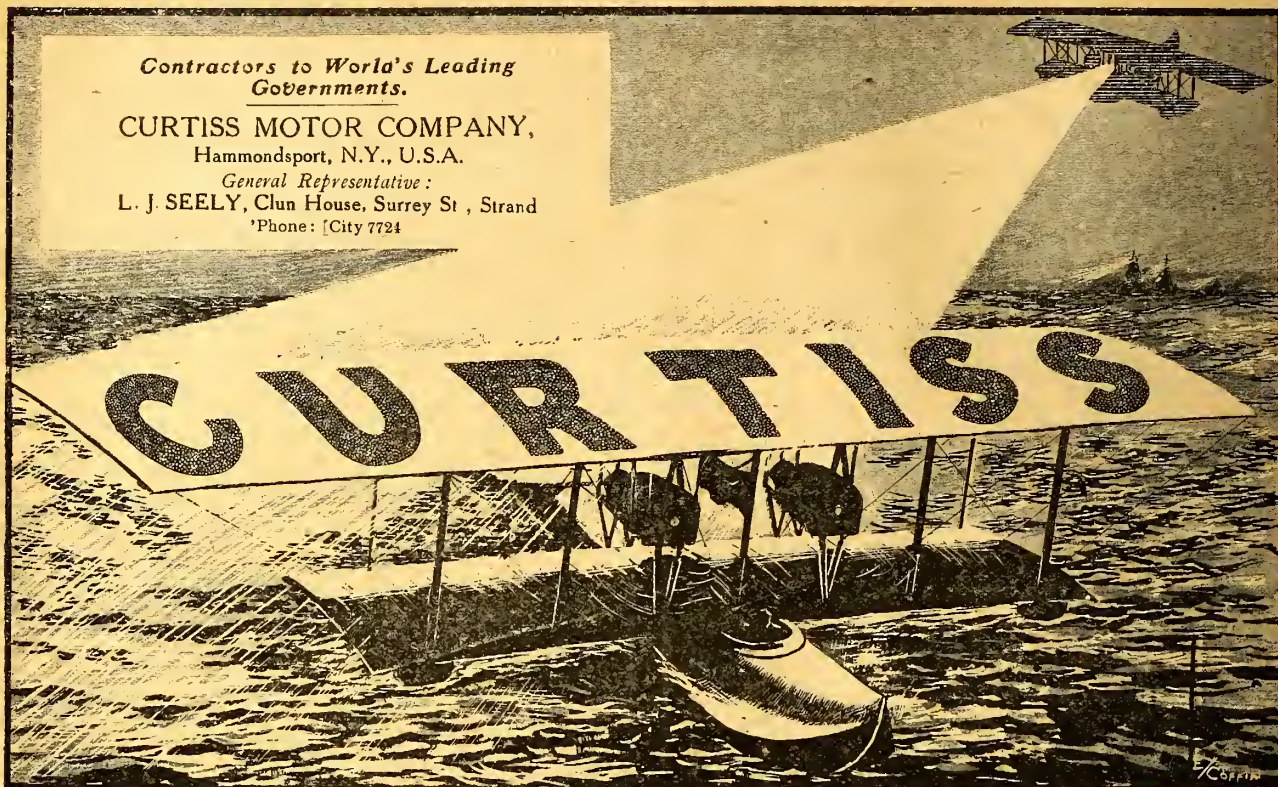
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DATES OF ISSUE.—MONTHLY LIST (completely illustrated, about 38 pages), No. 26, Wed., Oct. 4th, and No. 27, Wed., Nov. 1st. WEEKLY LIST (giving prices and particulars of stock on hand—not illustrated), No. 26A, Wed., Oct. 11th; No. 26B, Wed., Oct. 18th; No. 26C, Wed., Oct. 25th. SPECIAL LIST OF A.G.S. PARTS, Wed., Nov. 1st.

A SPECIAL LIST OF A.G.S. PARTS will be published on Nov. 1st next. This will contain about 28 pages and will include all the most important items. Each part will be illustrated by reproduction of actual photographs and blue print drawings. Complete dimensions and R.A.F. Material Specifications of all marked numbers will be given.

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ON THE WRIGHT PATENTS AND THE AIRCRAFT INDUSTRY.

AN OFFICIAL PRONOUNCEMENT.

Now that the end of the war is in sight for anyone possessing a sufficiently powerful telescopic imagination, it is, perhaps, not too early to deal with a matter which may have, or might have had, a very powerful effect on the whole Aircraft Industry after the war.

It will be remembered that various law actions fought in the United States have laid it down that the Wright patents of 1903 cover every possible means of controlling an aeroplane, except, perhaps, the Dunne type inherently stable aeroplane, which has no distinct lateral and directional controls, in the form of warp or ailerons operating in more or less dependence on a rudder control.

The Wright patent covered originally a mechanical connection between the wing warping control and the rudder, by which, when the wing was warped down on one side and so put a drag on the wing, which made it tend to turn towards that side, the rudder automatically turned the other way, and so kept the machine straight. In other machines, fitted with warp or ailerons, the rudder was quite independent of the lateral control, and the tendency of the aileron or warp to drag the machine round, instead of lifting that side of the machine, was counteracted by the pilot himself pushing the rudder round in the opposite direction.

One would naturally think that this cut out the Wright patent and its mechanical connection between the rudder and lateral controls. However, the ways of the Law are inscrutable, and it was apparently held that in law the pilot himself was part of the mechanism, and formed the necessary connecting link between warp and rudder. This doctrine was upheld in court after court in the U.S.A., and, for all I know, it may be still in dispute.

The chief opponent of the Wrights has been my esteemed friend Mr. Glenn H. Curtis, and, so far, he has avoided having a final definite verdict being brought against him, but other firms in America have caved in at the mere threat of legal action.

The Wright Brothers themselves were not ungenerous in their demands, but they naturally wanted to get back as soon as possible the value of the years they had spent in experimenting from 1902 or so till flying became common in or about 1910. I think the real trouble, when usurious fees were demanded in America for the permission to build, fly, design, or apparently even to think about an aeroplane, came when a syndicate of millionaires was formed to buy the Wright patents, to finance further experiments, and practically to corner the sport, art, science, and practice of flying.

Subsidiary companies were formed in France, Germany, and elsewhere. The British rights to build Wright aeroplanes were taken over by the Short Brothers, then of Leysdown, Isle of Sheppey, but no British Wright firm was then formed.

Nevertheless, the Wright Brothers desired to confirm the validity of their British patent, and the decisions in

the United States courts naturally caused some uneasiness in this country, for, if the patent were upheld, it would mean that the whole of the Aircraft Industry would be under the thumb of the administrators of the Wright patents.

Some time before the war a test case was arranged against the British Government, and the then Superintendent of the Royal Aircraft Factory, Mr. Mervyn O'Gorman, was nominated as the individual defendant. The case hung about till war broke out, and then the Government and the administrators of the Wright patents compromised, the former paying a sum of £15,000 to cover all royalties under the Wright patents on all Naval and Military aeroplanes, past, present, and future.

This amounted to an official recognition of the validity of the patent, and, that being so, the agreed sum seemed absurdly small, amounting, as it would, to a royalty of perhaps £1 per machine on the output of perhaps a couple of years before the output became really large.

The mere vulgar commercial mind could only put one of two constructions on the deal. Either one assumed that the administrators, or owners, of the Wright patents were exceedingly, indeed almost absurdly, patriotic in taking £15,000, when £150,000 would have been quite a modest demand, or else that the whole thing was a "put-up job" designed to obtain official recognition of the patent, which would thus be put in such a strong position that no business firm dare fight it.

Obviously, after obtaining a substantial, if inadequate, sum from the Government, the British Wright Company would be in a position after the war to "bleed" the Aircraft Industry to the limits of its endurance, and, although the patents will automatically run out in 1917, there would be good reason for pleading for a renewal of the patent, on the grounds that the £15,000 from the Government did not represent a reasonable profit on the patent, considering the immensely important part played by aeroplanes in the war. The renewal of the patent, which would be practically certain, would thus put the British Wright Company in complete possession of a perfect corner in British Aviation after the war.

Having this in mind, when considering that the British Aircraft Industry will have to create a world-wide business in sporting and commercial aircraft after the war, I wrote to Mr. Griffith Brewer, the Managing Director of the British Wright Company, Ltd.—himself one of the greatest friends of the Wright Brothers—and asked him whether it was yet possible to make any official pronouncement as to the action which was likely to be taken under the Wright patents when Peace comes.

THE RELIEF OF THE INDUSTRY.

Mr. Brewer, in his official position as Managing Director, has kindly authorised me to publish his reply, which should come as a distinct relief to an industry

which will probably be sufficiently harassed by other affairs in the future.

The whole official policy of the British Wright Company, past, present, and future, is set forth in Mr. Brewer's letter as follows:—

"Your letter asking me to let you have a forecast of the British Wright Company's attitude to the trade after the war shows that my statement on this subject in the Wilbur Wright Lecture was too Balfourian. I will now endeavour to call a spade a spade, and let you know just where we all are.

"Wilbur and Orville Wright have always looked on England, the home of their ancestry, as the most-favoured nation. The invention which developed from their summer outdoor sport and scientific experiments at home in the winter had to be exploited on the Continent by commercial companies, but in America they were able to look after the invention themselves. They refused many tempting offers of company flotation of the British patent, simply because they did not feel that an ordinary speculative company would control the invention in the best interests of aviation. Wilbur used to tell me that they intended to commence working over here themselves, and they would no doubt have done so had their American patent not been attacked so cruelly in the States.

"Wilbur and Orville made warm friendships in England, and many of those friends are indebted to those gifted brothers for considerable mental development by that friendly association. After Wilbur died, Orville had to bear all the responsibility of the Wright Company in America, so I suggested to him that he should entrust his friends over here with his British patent in order that they might obtain recognition for the work done by his brother and himself. I returned to England with this permission, and discussed with Alec Ogilvie [now Squadron-Commander R.N.—Ed.] how we could do this with the least disturbance to the aviation industry. We wanted to obtain recognition for the Wrights, but we did not want to enrich the lawyers at the expense of the struggling aeroplane industry.

"We therefore brought a few of the Wrights' friends together, including Frank McClean, T. P. Searight, Percy Grace, and Maurice Egerton [now respectively Squadron-Commander R.N., Captain A.S.C., Captain R.F.C., and Major of Yeomanry attd. R.F.C.—Ed.], and we formed the British Wright Company.

"After obtaining the Government consent, an action was commenced in the Courts against the War Office for infringement of the patent. The sum claimed was £25,000, this sum appearing to us the smallest compatible with real recognition.

"As in the case of most law actions, the hearing was delayed, but it would have come into court within two years—i.e., before the end of 1914—had the war not intervened.

"When war was declared, the directors of the British Wright Company met, and discussed how they could get rid of the action, because they all wanted to help the Government, and it was felt that the action might prejudice their freedom. An offer was made to accept £15,000 in settlement, and this was accepted by the Treasury, for past, present, and future use of the patent on all Government machines.

"This settlement left the company with the patent rights for sporting use and for manufacture for export to foreign countries. The directors decided, however, not to worry the aviation industry now that their object had been attained, and so with regard to the past no application has been made to any manufacturer for royalty, and so far as I am aware no application ever will be made for the past use of the patent.

"I cannot, however, bind the British Wright Com-

pany in any way, because some past infringer might publicly assert that he did not recognise the validity of the Wright patent, and never had and never would do so. My fellow directors are generous men, and in these circumstances they would like to retain the privilege of according satisfaction to the manufacturer who desired to test the question of validity in the Courts. A writ for infringement may therefore still be obtained by any infringer on application.

FUTURE POLICY.

"With regard to your question as to the future, I think I can give you all the assurance you desire. Unless an extension of the patent be granted, the ordinary fourteen years' monopoly will run out on March 23rd, 1917.

"With the consent of Mr. Orville Wright, the British Wright Company will not apply for the extension, so every manufacturer in England will, from March 23rd next, be free to manufacture without payment of any royalty.

"Recognition of the greatest invention within living memory has been secured without disturbing the aeroplane industry, and the surviving patentee has practically presented his life's work as a gift to the British Nation. May they use it for the extinction of those exponents of Kultur who are dropping their emblems on these shores.

"Before closing this letter I should like to acknowledge the powerful disinterested support extended by Lord Northcliffe, who has always taken a keen interest in the uphill fight of the Wright Brothers, and who, when he learnt of the generous terms of settlement accorded to the British Nation, wrote to say how nobly Orville had behaved.

"I think you will endorse this view, because you recognised, when the terms of the Government settlement were announced two years ago, the power secured by this official recognition, and you pointed out to me what a disastrous effect this might have on the aviation industry if the British Wright Company were not moderate in their demands. It is therefore to be hoped that the spontaneous views expressed by Lord Northcliffe and yourself will be shared by all who now learn these facts for the first time.—Yours very sincerely,

(Signed) "GRIFFITH BREWER,

"Managing Director of the British Wright Co., Ltd."

The sporting offer of the managing director of the British Wright Company, Ltd., to afford legal satisfaction to any past infringer who desires to spend War Profits in the Law Courts in salving his conscience of any moral burden he may feel is highly to be commended, but one does not imagine that anyone will henceforth dispute the validity of the patent.

The word generosity seems sadly inadequate to express an action which thus presents to the British Aircraft Industry the free use of a patent which, if upheld in court, would endow the holders thereof with such far-reaching powers.

Even if the British Wright Company fought an action against, say, the Society of British Aircraft Constructors, and lost, it would entail vast expenditure on legal expenses of good money which can be much better employed in the future development of aircraft.

Therefore, not only the Aircraft Industry, but the British Nation as a whole, is placed under a permanent debt of gratitude, which will be itself a standing monument to the Wright Brothers in time to come. Never in history has a single patent covered such momentous issues as the control of an epoch-making military arm and the development of an entirely new method of locomotion. That such a patent should be freely given to this country is indeed the widest possible interpretation of the "most-favoured nation" clause.

Those names mentioned in Mr. Brewer's letter deserve to go down to history together with the names of the Wright Brothers as good sportsmen and patriotic gentlemen, and this is far from being the first great service to

British aviation rendered by the same little company of aeronautical pioneers.

One can only hope that some day their good works will be duly recognised.
C. G. G.

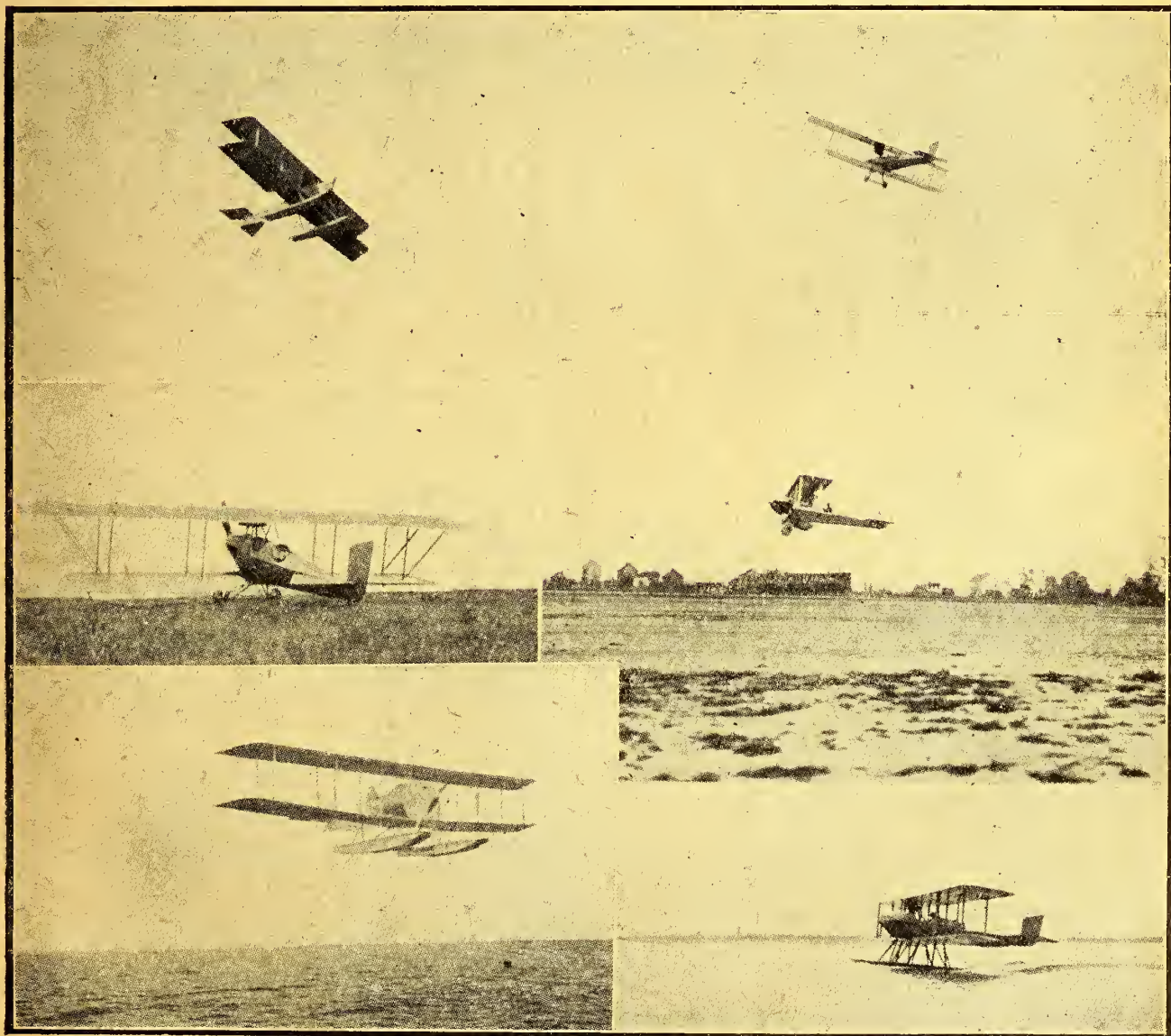
ON OUR AERIAL SUPERIORITY.

So much has been said and written of late about the supremacy of the Allies in the air that it may be worth while to discuss, for the benefit of the uninitiated, what has been happening; therefore officers and men of the R.F.C. will find these notes singularly uninteresting; but, by way of compensation for myself, I hope those who have only recently begun to concern themselves with aviation may find some interest therein. For the indisputable superiority of the R.F.C. over its opponents the highest credit is due to those officers who have produced the method, order, and organisation which have made the British shore-going Flying Service so highly successful in the past nine months.

Naturally, newspaper correspondents—or the people who pass for newspaper correspondents in these days—exaggerate the degree of superiority of the Allies in the air, for the Germans are a long way from being beaten yet. The Casualty List proves that.

The list of Missing proves little, for all or any of those whose names appear therein might have been brought down by defective R.A.F. engines, and not by any effort of an enemy, but for the fact that so many more reliable engines, such as Beardmores, Clergèts, and le Rhône, are now coming into use. But the lists of killed and wounded do prove something, for all those mentioned cannot be the victims of landing on impossible ground after engine failure, nor can breakages of machines in the air account for more than a small number of them, despite the evidence at a recent inquest showing that an R.A.F. machine on test broke owing to a structural defect.

One finds the key to the situation in the private obituary notices, stating that the subject of the notice was shot down while on patrol over the German lines, or shot down in an air fight; and one hears that the great majority of those logged as wounded have also been



Types of Sturtevant Land and Seaplanes.

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hit in fights or by anti-aircraft guns, although people who are hurt in smashes, whether owing to bad flying or not, are also returned as "wounded," and not as "injured," as is the Navy custom.

There is plenty to show that the German still retains plenty of hitting power in the air. The Casualty List proves it by being longer than it was even when the "Fokker Scourge" was at its worst; but before drawing any conclusions from that it is necessary to remember that the R.F.C. has increased and multiplied so enormously since October of last year that one might divide the Casualty List by ten, or thereabouts, to get a fair estimate of the relative rate of casualties. The great difference is that, whereas the R.F.C. was then on a kind of defensive-offensive, it is now purely on the offensive.

That is to say, our people used to stagger tail down across the lines a year ago on one of the comic (or rather tragic) Christmas-trees of the period, laden with machine-guns, pistols, cameras, food, and all sorts of things, taking an hour to crawl up to 8,000 feet or thereabouts, or chancing the attentions of "Archie" and making a gallant dash through his zone of fire at about 60 miles an hour at 5,000 feet or so—and when they got to the other side they were probably pounced upon by a Fokker or two dropping on them from thousands of feet above. The Fokker is a pretty poor kind of aeroplane, but it was vastly better in climb and speed than our average machine of a year ago. Consequently, although our people were on the offensive to the extent of continually crossing the lines, they were always on the defensive when they got there, except the lucky men on the scouts and tabloids.

To-day things are absolutely changed. Our people have their tails up, morally and mechanically, and, though they have plenty of fighting when they get to the other side of the lines, they are on the offensive all the time. The moral as well as the physical uplift is considerable, when one has a machine which will get above Archie's range of accurate fire in a quarter of an hour, and will do in or about 100 miles an hour when pushed. With such a machine one can attack and keep on attacking; and though perhaps not even the majority of our people are mounted on such machines, the worst machine at the front to-day is probably nearly as good as the best of a year ago, and there are enough of the first-class machines to protect the weaker brethren. Hence, in a general way, the change in the *moral* of the R.F.C.!

THE FIGHTING OF TO-DAY.

Nevertheless, it is as well to make it clearly understood that life in the R.F.C. at the front is not entirely a picnic, as one might gather from some of the accounts which appear in those papers devoted to persuading the populace that everything done by this Government and its hangers-on has always been the result of inspired genius, and that we are now reaping the fruits of the labours of the greatest Cabinet the world has ever seen. The truth is that, after fifteen months of the most appalling muddling in history, public opinion below and Service pressure on top has forced the good men out of the ruck, and after nearly a year of strenuous labour those good men are making themselves felt.

Some gallant lad in the R.F.C. may sail cheerfully into the middle of a dozen Hun aeroplanes, break up their formation, wipe out a couple, damage two or three more, and disperse the rest, single-handed, but that merely proves the spirit of the Corps and the excellence of some of the machines now in its possession. It indicates superiority in the air, but not the absolute command of the air. When such a formation of enemy machines is habitually attacked by an equal number of the R.F.C., shepherded over our own lines, and all its members shot down or compelled to land and surrender, then, and not till then, can we talk of the absolute command of the air.

OFFICIAL FIGURES.

G.H.Q. communiqués between September 19th and September 25th, inclusive, claim that sixteen enemy aeroplanes were destroyed, and eleven were driven to the ground in a damaged condition, also that one kite balloon was brought down by the R.F.C. Against this it is stated officially that in the same period nineteen of the R.F.C. machines were missing, and, of course, a certain number must have returned severely damaged. In fact, it is related that one plucky and skilful pilot flew over 30 miles home on an almost uncontrollable machine after colliding with an enemy machine.

Even making allowances for machines which failed to return, owing to defective engines, it is evident that the Germans must have put up a very good fight, albeit entirely on the defensive. That being so, it is obviously as foolish to shout about the "command of the air" at present as it would be to claim that the war is already won just because the Allies have advanced a considerable distance on the Somme front, and because Mr. Atkins's cheerful pessimism has given place to a feeling that the worst period of "sticking it" is over, and that, barring more than usually idiotic mistakes by the Government or the Staff, he cannot help winning the war.

LOSSES IN ATTACK.

There is a theory, which has foisted itself on some people as an axiom of war, dating from the early days of "villainous saltpetre," that an attacking force must necessarily lose more heavily than a defending force, and this will no doubt satisfy many soldiers of the old school if either our infantry or our aviators prove in the end to have suffered more heavily than the enemy they have defeated. It was not so in the days of hand-to-hand fighting, for the drilled and disciplined phalanx of Philip of Macedon forced its way through hordes of equally brave fighters without appreciable loss. Similarly, Cæsar's legions developed a new science of war which in its turn attacked and defeated the Macedonian phalanx and the Teuton hordes with equal ease, though the Teuton was certainly more powerful, man for man, than the little Roman legionary.

Losses in attack depend entirely on the brains behind the attack. Our losses in attack at Neuve Chapelle and Loos would have been negligible if we had had there as many of the so-called "tanks" as were employed on the Somme: and there is no reason, except lack of official intelligence, why we should not have had them. Our losses on the Somme would have been a fraction of what they have been, if we had had the new-type "tanks" which I know to have existed complete on paper long enough ago for them to have been in use on the Somme, and if they had been employed in quantities in the proper tactical way, instead of going gallumphing about the country at the sweet will of their skippers, like a lot of land-going privateersmen.

In just the same way, if we had had in use from October, 1915, to, say, March, 1916, the machines we are now using—as we might have had if a free hand had been given to officers like those who have since done such excellent work—our aviators could have attacked then with as little proportionate loss as the Corps is now suffering. And if the question of supplies of aeroplanes and engines had been properly handled in 1915, we should be far ahead of where we are now in the equipment of the R.F.C. In fact, we should by now be employing in quantities machines which would cause as much consternation among German aviators as the "tanks" have done among German machine-gunners.

A GENTLE HINT.

However, despite all the errors of the past, the R.F.C. has certainly acquired dominance, if not absolute command, in the air, and for that fact very great credit is

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due to the officers who have so thoroughly reorganised affairs at the War Office, and who have so notably increased the performance and output of the machines now in use. Nevertheless, more and better machines are needed, and much still remains to be done before the maximum efficiency and the maximum rate of output of aeroplanes and engines are reached.

A great deal of material and many man-hours of work are still lost through over-inspection. Naturally a department which has grown as rapidly as the A.I.D. has done cannot be expected to acquire thousands of inspectors, examiners, and viewers, each and all possessing experience and knowledge of aircraft requirements, and so it would not be safe to leave too much responsibility in the hands of the inspection staff. And the difficulty is increased by the psychological fact that the class of man who knows most is the least willing to accept responsibility, while the man who will cheerfully accept responsibility is the least likely to know his job. Consequently things have to be done largely according to severely fixed rules.

Nevertheless, there is still room for improvement in the higher grades of the A.I.D., where responsibility has to be taken. One knows that the Staff is desperately hard-worked, and all that; but, even so, many delays might be avoided by speeding up decisions on important points, without waiting for conferences with or confirmation by senior officers who probably know nothing at all about the technical points under discussion.

LIMITS.

Specifications and size limits ought to be arranged on a commercial scale, and not on the scale of a chemist or a scientific-instrument maker. For example, one may quote the imposition on spare parts for certain French engines of size limits so close that the original engines as they came from France would have been condemned if submitted to inspection. Or, again, one may mention the specification that drop forgings for certain aeroplane parts must be minus nought or plus a thousandth of an inch, as they come from the dies. And this on parts which might in certain cases equally well be pressed out of sheet stuff. And, further, there is the insistence that such parts must be either machined or filed all over by hand, so as to get a pretty finish and perhaps take off a thousandth part of the weight.

Such demands for fineness of work lead to scrapping of material which is valuable in itself, and has been made far more so by the man-hours spent in working it up to the point at which it is condemned.

Apart from which, it takes all the heart out of the workmen when they find stuff which they know to be serviceable, and on which they have spent their good-will and energy, being scrapped by inspectors whom they know to be less capable of judging work than they are themselves, and all because the article condemned is small or large on some purely arbitrary dimension imposed by a draughtsman who put it there because he thought it looked pretty.

A TIP FROM THE MINISTRY OF MUNITIONS.

In such matters the A.I.D. and those who control it would do well to study the methods of the Ministry of Munitions in producing shells, grenades, and other articles of frightfulness. There the method seems to be to find out what is wanted, and get it through as quickly as possible, seeing at the same time that it is fit for its job, and without worrying about fancy finish or microscopic limits in places where they do not matter.

If the production of aircraft had been tackled as energetically and as understandingly as the "Ministry"—as it is called by its inmates—has tackled the production of other species of armament, the R.F.C. might by now be even better equipped than it is.

INSPECTION GONE MAD.

It is enough to make one weep sometimes to see the material and labour wasted by super-inspection. One goes round a propeller-shop, for example, and sees perfectly good propellers stamped "Rejected" because of some slight variation from the official template, or because of a dent on the surface or edge, although these defects do not make the propeller any the worse in use, and do not imply any defect in workmanship or material. In fact, by the time a quite perfect propeller has been unpacked and packed two or three times by R.F.C. mechanics it has probably developed worse defects than those for which its twin was rejected.

I have seen propellers which were perfect in every respect rejected (by an Admiralty man, it is true) simply because the colour of one strip of wood did not match the rest, and not merely rejected but destroyed, so that they could not even be sold for school work.

THE IGNORANCE OF THEORISTS.

If minute defects made any difference to the efficiency of a propeller, one would not resent super-inspection, but the fact is that so little is known about propeller design that one propeller which is quite seriously defective, with bits jagged out of the edge and humps and hollows all over its surface, will often enable an aeroplane to do a better performance than a theoretically perfect propeller.

The prize example of this was the case of the B.E.8, for which the high-brows of the R.A.F. designed a wonderful four-bladed tractor-screw, theoretically perfect for the designed speed and power of the machine. Hundreds of these were built, so as to be ready when the machines came through. Dozens were rejected for trifling surface defects. And when some thousands of pounds had been spent on the things, it was found that the machine would barely stagger off the ground with them, because the high-brows had forgotten that the diameter of an 80-h.p. Gnome, plus its cowl, was enough to blanket the greater part of the screw, and prevent the air from getting away from it, so that all the real work had to be done by the little thin flexible tips of the blades.

In one case some ignorant practical person put on an old common two-blade screw, which had been knocking about the shop for months, and had been designed for quite a different machine, and thereupon B.E.8 on test showed distinct signs of flying, though it was never even an average good aeroplane. After which, I believe, the R.A.F. condescended to design a new screw, and, of course, the others, and the thousands of man-hours they cost, had to be scrapped.

USEFUL SCRAP.

Other parts besides propellers are scrapped in a similarly arbitrary way. Spars, struts, longerons, and so forth are rejected for the most trifling defects which are not defects at all, and Heaven alone knows how many man-hours are thus wasted. In fact, one of the best aeroplanes I ever knew was built by a certain firm entirely out of A.I.D. rejects, and was used regularly by a friend of mine as a means of getting about the country just as he would otherwise have used a car, and so the R.F.C. was deprived of an aeroplane which was a good deal better than most of those which were in use at that time.

A.I.D. DIFFICULTIES.

One could go on quoting *ad nauseam* cases in which over-insistence on specified sizes by A.I.D. officials has wasted material which was badly needed on active service. Such cases as I have mentioned are not dragged up in any captious spirit, for they are not directly the fault of the senior officials. They are quoted in order to indicate the directions in which alterations of the inspection system are needed.

Much of the waste is caused by the absurd designs, specifications, and limits—and mistakes—in R.A.F. draw-

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ings, which appear to be as bad in the latest R.E.s as in the early B.E.s. The A.I.D. minor officials are bound to work to these drawings and cannot help themselves. What the people at the top of the A.I.D. should do is go carefully over a machine built to these drawings and draw up a list of "tolerations" which are real tolerations, indicating just where strict limits must be kept, and where they do not matter.

One quite realises that A.I.D. viewers and examiners cannot be allowed unlimited discretion, simply because of the basic psychological fact that 80 per cent. of the population is incapable of forming a sound judgment on anything which requires reasoning power, and a further 10 per cent., if capable of reasoning, is afraid to trust its own judgment, so that, unless the A.I.D. had recruited its officials entirely from the remaining 10 per cent., which it has not, the people at the top cannot possibly trust their minor officials to exercise judgment. It is, in fact, debatable whether all the heads of departments themselves come into the last 10 per cent. of the population specified hereinbefore, for mistakes are not unknown even in the highest grades.

ACCELERATING OUTPUT.

However, if the higher officials will go thoroughly into the question of output, and will allow a certain amount of latitude without laxness, and some relaxation of limits without slackness, they will find that they will obtain many more much better aeroplanes for the same expenditure of material and man-hours. In the days of the late Colonel Fulton, every examiner and viewer was made to understand clearly that he was there to pass everything fit for use, and not to reject things unless he had to. Apparently many of the newer men do not understand this aspect of their duty, or else have never had it impressed on them.

I am perfectly certain that, if a sympathetic officer of the A.I.D.—not in uniform on any account, for a uniform immediately scares an Englishman into keeping his mouth shut—went round from factory to factory, simply looking for complaints of delays caused by unnecessarily fine limits or finicky specifications, and asking for suggestions as to how details of design could be altered so as to accelerate manufacture and prevent labour troubles, he would be worth thousands a year to the country. Anyhow, he would be worth more than any Superintendent R.A.F. or Consulting Engineer could ever be in hurrying output.

In American and in some British factories they have an official called a "booster," or sometimes a "chaser," whose job it is to run round and find out what is holding up deliveries, to remove obstacles to progress, and to discover suggestions for further acceleration of output. The A.I.D. badly needs officials of that sort. And it probably needs someone else, right up near the top, who knows enough about manufacturing processes to judge at once which of the "booster's" suggestions are worth carrying out, and who has enough power to order them to be carried out, without reference to S.R.A.F.s, or Consulting Engineers, or anyone else.

Only the other day I was shown some sketches of parts of the latest R.E.s, together with suggestions for alterations in design and finish which would make it possible to increase the output enormously. Yet those alterations will never be made, because it is nobody's job to hand the

suggestions on to Adastral House, and there is probably nobody at Adastral House who has the power to insist on the alterations being made at once, without months of palaver with Farnborough.

THE NEED FOR A CENTRAL CONTROL.

As a matter of fact, the whole system of producing aeroplanes needs reform, if the maximum possible output for the material and man-power employed is ever to come within reasonable distance. At present it is probably something less than half what it might become under a thoroughly good system of organisation. To begin with, some central power is needed which will control all labour, material, and design. That central control must be in the closest touch with active service aviators. They and they alone count.

All the theorists and mathematicians and experimenters and comic professors of this, that, and the other science which is more or less of use in aeroplane work must be employed simply as instruments, but they must have no say whatever in manufacture. They may suggest improvements, but they must have no power to interfere with designs or processes of production.

The active-service pilots know what they want. The manufacturers know how to give it to them. The central power is needed to see that the right stuff is delivered in the minimum time with the minimum waste of material and labour.

The A.I.D. might be that power. There are enough clever and earnest men in the A.I.D. to produce ten times the present output if they were properly employed and were not hampered by hide-bound seniors.

People grouse about War Office red tape. There is nothing the matter with red tape *per se*. The trouble is the people who use it. Red tape is a nice, clean, strong material, admirably suited to its purpose. Properly used, it keeps everything neat and tidy and readily accessible. The man who knows how to handle it will put one piece of red tape round the girth of a parcel and over the ends, and will enclose therein the archives of a nation. The trouble comes in when some silly old woman binds up a document concerning some small but essential detail into a kind of red-tape-bound mummy, and then forgets where she (or he) has interred it. That process repeated over and over again is what delays movements in Government offices. Which thing is a parable, for the A.I.D. as well as other people.

If we had a great national leader who would conscript brains as well as bodies, and would see that good brains in defective bodies were not wasted in the trenches, while sound bodies with defective brains were worried into a state of imbecility over administrative work in offices, we might not only win the war at our ease, but even find it worth while to keep it going for another ten years or so and run it at a profit.

However, that has nothing to do with the A.I.D., which is really doing quite good work, and might be doing a great deal better if it had more power to deal with the troubles which beset it, and if it were not so much bound down to the behests of others.

When we are actually getting the very best quality and quantity out of the Aircraft Industry, then the Command of the Air will follow as a natural sequence.

C. G. G.

COMPARATIVE FIGURES.

The "Times" has made the following computation of the air losses on the Western Front:—

According to the British, French, and German communiqués, at least 322 machines have been placed *hors de combat*. Some of these have been wholly destroyed; others have been more or less seriously damaged. For the first time, British General Headquarters in France has stated definitely that enemy machines were destroyed, the number placed in this category during September being 53. Forty-seven others are specifically reported as having been brought

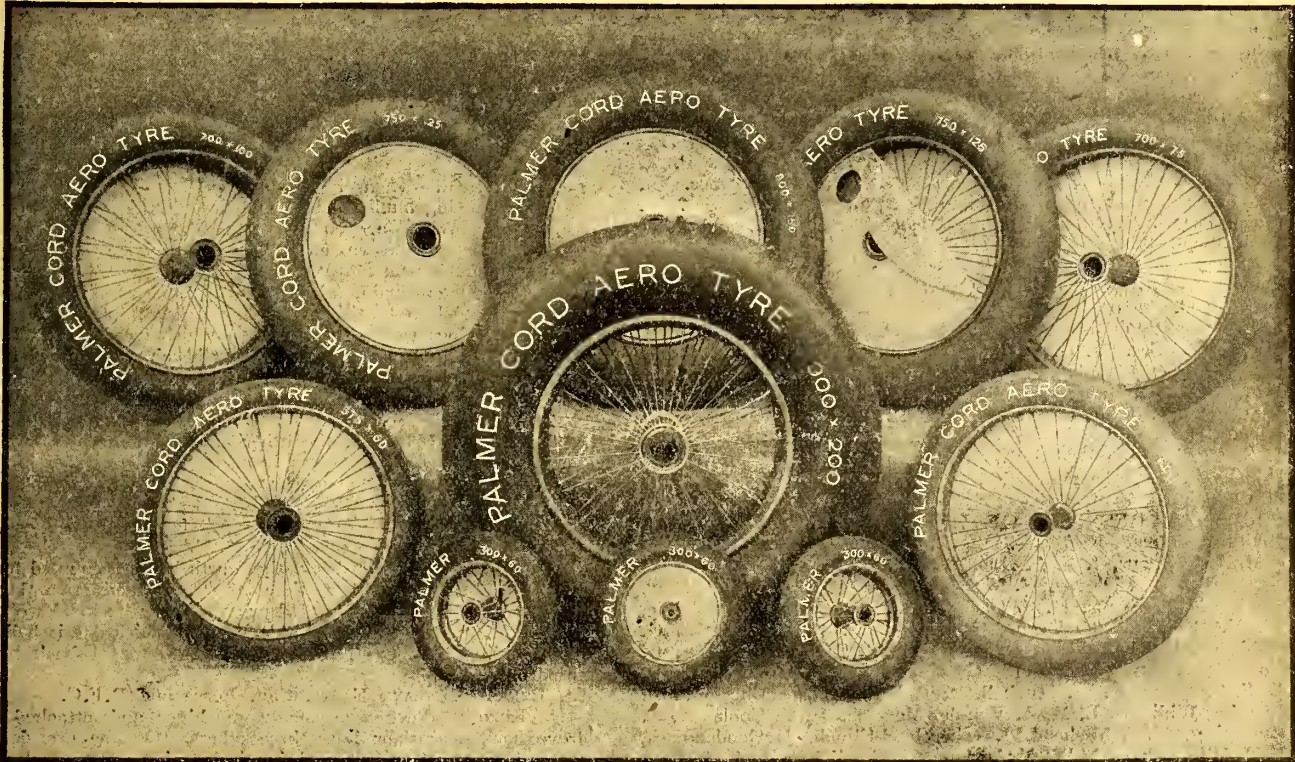
or driven down damaged, while on several occasions "many" or "several" others are stated to have shared the same fate. The victims claimed by the British thus number, at least 100. Against this, a loss of 48 British machines is admitted.

The French military authorities report that in September their aviators and gunners brought down 100 German machines, and that six others were forced to land. It is claimed that a large proportion of these were destroyed. The Germans, on their part, declare through their daily official reports that they have accounted for 116 enemy machines.

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300 × 60	16	m/m 111.12	m/m 25.4	Central	700 × 75	9	m/m 178.	m/m 44.45	132/46	750 × 125	2	m/m 185.	m/m 55.	135/50
"	17	72.39	12.7	Central	"	20	178.	38.1	132/46	"	4	185.	55.	entral
450 × 60	30	89.	31.75	Central	"	75	178.	31.75	132/46	"	18	178.	44.45	132/46
575 × 60	14	150.	38.1	104/46	700 × 100	2	185.	55.	135/50	"	26	150.	40.	Central
"	21	160.	28.	Central	"	4	185.	55.	Central	"	33	150.	38.1	Central
"	34	150.	31.75	104/46	"	18	178.	44.45	132/46	800 × 150	8	185.	55.	135/50
600 × 75	14	150.	38.1	104/46	"	26	150.	40.	Central	"	10	185.	55.	Central
"	21	160.	28.	Central	"	33	150.	38.1	Central	900 × 200	42	185.	60.32	125/60
"	34	150.	31.75	104/46	"	38	185.	38.09	132/46	"	47	185.	55.	125/60
"					"	66	178.	38.89	132/46					

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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Sept. 26th, 1916.

WAR OFFICE, Sept. 26th.

REGULAR FORCES.—STAFF.—*The following temporary appointment is made at the War Office:—Staff Capt.—Temp. Sec. Lt. (temp. Capt.) M. K. Cooper-King, Gen. List, from a Flt. Comdr., R.F.C., and to retain his temp. rank whilst so emplyd., Aug. 12th.

ESTABLISHMENTS.—R.F.C.—Flt. Comdrs.—Lt. P. B. Prothero, Arg. and Suth'd Highrs., S.R., from a Flying Officer, and to be temp. Capt. whilst so emplyd., Sept. 3rd. Temp. Capt. N. J. A. L. Prinsep, Gen. List, from a Balloon Officer, Sept. 12th. From Flying Officers, and to be temp. Capt. whilst so emplyd.:—Temp. Lt. V. Busby, R.E., S.R.; Lt. L. T. N. Gould, R.A., Sept. 14th.

Flying Officers.—Lt. G. Alchin, R.F.A., S.R., from a Flying Officer (Observer), Aug. 29th, but with seny. from Nov. 22nd. Lt. W. S. Scott, Lan. Fus., T.F.; Sec. Lt. F. Hall, Dorset R., and to be secld., Aug. 31st. Capt. G. C. Pirie, Sco. Rif., S.R., from a Flying Officer (Observer), Sept. 1st, with seny. from May 4th. Sec. Lt. J. Seabrook, S.R., Sept. 1st. Temp. Sec. Lt. N. L. Robertson, Gen. List, from a Flying Officer (Observer), Sept. 2nd, but with seny. from Feb. 15th. Sec. Lt. (on prob.) F. St. J. F. N. Echlin, R. Fus., S.R., from an Asst. Equipt. Officer; Sec. Lt. W. E. Reed, Durh. Fort. Engrs., R.E., T.F.; Temp. Sec. Lt. H. D. Addis, Gen. List, Sept. 5th. Lt. P. B. Tabernacle, Princess Patricia's Can. L.I., Sept. 6th. Sec. Lt. F. L. Harding, Som. L.I., and to be secld., Sept. 7th. Sec. Lt. (on prob.) B. K. O. Mathews, 3rd North'n R., S.R., and to be secld., Sept. 8th.

Flying Officer (Observer).—The rank of Capt. W. A. Fleming, Devon R., is as now described, and not as in the "Gazette" of Sept. 22nd.

Assistant Equipment Officers.—Sec. Lt. L. S. News, S.R., May 15th. Sec. Lt. G. T. Beer, Devon R., T.F., Sept. 4th.

MEMORANDA.—To be temp. Sec. Lts. for duty with R.F.C.:—Spr. C. V. Thornton, from Lond. Electrical Engrs., T.F., July 19th. Pte. S. T. Fradd, from Devon R., T.F., Aug. 21st. Petty Officer D. Armitage, from R.N.A.S., Sept. 10th. Temp. Capt. J. S. Curtis, from R.M.A.R., Sept. 11th. Actg. Sgt. A. Wragg, from R.F.C., to be temp. Sec. Lt. for duty with the Mil. Wing of that Corps, Sept. 14th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) confirmed in rank:—M. A. Seymour, J. F. A. Day, W. H. Trinder, G. D. Rae, L. S. News, H. W. Sidley, A. J. Winstanley, P. S. Butterworth, S. P. Stocks, D. S. Evans, H. S. Counsell, G. H. Jacob, J. W. Baillie, W. V. Bevon, F. C. Deane, C. H. Bell, A. B. Drewery, P. G. Robinson, R. M. Neill, A. O. K. Wright, J. Seabrook, G. Barrett. To be Sec. Lts. (on prob.):—G. E. Osmond, M. F. A. Paine, E. F. Cameron, R. W. Mitchell, R. T. Royse, D. B. Thorp, C. R. Fleming-Williams, E. M. A. Van-der-Meersch, W. G. Cooke, T. T. Cumming, H. Whitehead, J. Wheatland-Clinch, J. Goodenough, C. J. W. Hosken, A. W. McAuslane, F. O. Gibbon, J. J. Bartlett, R. E. Chadderton, E. C. McKenzie-Martyn, H. Tallis, H. N. Stradling, R. R. Richards, P. H. S. Gwilliam, Aug. 21st. M. R. Grover, Aug. 22nd. G. T. Bridgewater, Sept. 22nd.

SECOND RESERVE.—R. WAR. R.—Temp. Sec. Lt. K. V. Stratton resigns his commission on appt. to the R.N.A.S., Sept. 16th.

TERRITORIAL FORCE.—R.H.A.—BERKS.—Sec. Lt. H. F. Evans is secld. for duty with R.F.C., Sept. 8th.

R.E.—DURHAM FORTRESS ENGRS.—Sec. Lt. W. E. Reed is secld. for duty with R.F.C., Sept. 5th.

INFANTRY.—R. W. SURR. R.—Sec. Lt. O. R. Knight is secld. for duty with the R.F.C., Aug. 21st.

W. YORKS R.—Sec. Lt. W. L. Birch is secld. for duty with R.F.C., Aug. 25th.

GORDON HIGHRS.—Sec. Lt. D. M. Bisset is secld. for duty with the R.F.C., Aug. 31st. Lt. A. W. Ruthven-Stuart is secld. for duty with the R.F.C., Aug. 21st.

From the "London Gazette" Supplement, Sept. 26th, 1916.

His Majesty the King has been graciously pleased to approve of the appointment of the undermentioned Officer to be a Companion of the Distinguished Service Order, in recognition of his gallantry and devotion to duty in the field:

Sec. Lt. (temp. Lt.) ALBERT BALL, M.C., Notts. and Derby R. and R.F.C.

Observing seven enemy machines in formation, he immediately attacked one of them and shot it down at 15 yards' range. The remaining machines retired. Immediately afterwards, seeing five more hostile machines, he attacked one at about 10 yards' range and shot it down, flames coming out of the fuselage. He then attacked another of the machines, which had been firing at him, and shot it down into a village, when it landed on the top of a house. He then went to the nearest aerodrome for more ammunition, and, returning, attacked three more machines, causing them to dive under control. Being then short of petrol he came home. His own machine was badly shot about in these fights.

The undermentioned has been awarded a Bar to his Distinguished Service Order for subsequent acts of conspicuous gallantry:

Lt. ALBERT BALL, D.S.O., Notts. and Derby R. and R.F.C.

When on escort duty to a bombing raid he saw four enemy machines in formation. He dived on to them and broke up their formation, and then shot down the nearest one, which fell on its nose. He came down to about 500 feet to make certain it was wrecked. On another occasion, observing 12 enemy machines in formation, he dived in among them, and fired a drum into the nearest machine, which went down out of control. Several more hostile machines then approached, and he fired three more drums at them, driving down another out of control. He then returned, crossing the lines at a low altitude, with his machine very much damaged. (The award of the Distinguished Service Order is also announced in the "Gazette" of this date.)

His Majesty the King has been graciously pleased to confer the Military Cross on the undermentioned Officers in recognition of their gallantry and devotion to duty in the field:

Sec. Lt. NORMAN BREAKLEY, L'pool R., Spec. Res., and R.F.C.

He went out to attack an enemy kite-balloon and managed to get immediately above his objective. He then pretended that he had been hit by anti-aircraft fire and side-slipped down to 1,500 feet, when he suddenly dived at the balloon, which was being hauled down, and fired into it until he almost touched it. When at 300 feet from the ground the balloon burst into flames and was entirely destroyed. He then returned. Temp. Capt. GERALD DIXON-SPAIN, R. Fus. and R.F.C.

Captain Dixon-Spain, with Sec. Lt. Reid as pilot, attacked and drove back a hostile machine. A few minutes later four hostile machines were seen, three of which were attacked, one after another, and driven back the fourth being accounted for by another patrol. Another time they attacked two hostile machines, shot one down, and drove the other back. Two days later they attacked two more machines, of which one is believed to have been destroyed, the other being pursued back to its aerodrome.

Sec. Lt. GUY PATRICK SPENCE REID, Sea. Highrs. and R.F.C.

Capt. Dixon-Spain, with Sec. Lt. Reid as pilot, attacked and drove back a hostile machine. A few minutes later four hostile machines were seen, three of which were attacked, one after another, and driven back, the fourth being accounted for by another patrol. Another time they attacked two hostile machines, shot down one and drove the other back. Two days later they attacked two more machines, of which one is believed to have been destroyed, the other being pursued back to its aerodrome.

Lt. ERNEST DORLAND HICKS, Can. Force and R.F.C.

He brought down two enemy machines and attacked and drove back over their lines three others. On one occasion he came down to 800 feet and bombed trains. On another he came down 300 feet and dropped bombs on a station.

* * *

From the "London Gazette" Supplement, Sept. 27th, 1916.

WAR OFFICE, Sept. 27th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdrs.—From Flying Officers, and to be temp. Capt. whilst so emplyd.:—Temp. Sec. Lt. H. C. Wakefield, Gen. List; Sec. Lt. H. R. Hawkins, S.R., Aug. 1st. Capt. C. G. Burge, York. and Lanc. R., from a Flying Officer, Sept. 1st. From Flying Officers, and to be temp. Capt. whilst so emplyd.:—Lt. W. W. Higgin, L'pool R., T.F.; Lt. S. T. L. Greer, Lond. Brig., R.F.A., T.F.; Lt. C. A. Brooks, Wilts. R., Spec. Res.; Temp. Lt. G. J. Jones, Gen. List; Sec. Lt. (temp. Lt.) W. Astell, 1st Lovat's Scouts Yeo., T.F.; Sec. Lt. O. A. Westendarp, Lond. R., T.F.; Sec. Lt. A. C. Wilson, 12th Lrs.; temp. Sec. Lt. H. Barker, Gen. List; Sec. Lt. D. Gille, Devon R.; Sec. Lt. (on prob.) J. O. Archer, R.F.A., Spec. Res.; Sec. Lt. C. S. Ross, Spec. Res.; temp. Sec. Lt. R. J. Lillywhite, Gen. List; Sec. Lt. W. S. R. Bloomfield, Spec. Res.; temp. Sec. Lt. F. M. Ballard, Gen. List, Sept. 1st. Temp. Sec. Lt. (temp. Lt.) G. A. N. Mitchell, R. Fus., from a Balloon Officer, and to be temp. Capt. whilst so emplyd., Sept. 4th. Sec. Lt. D. H. Dabbs, Berks Yeo., T.F., from a Flying Officer, and to be temp. Capt. whilst so emplyd., Sept. 10th.

Equipment Officer.—Sec. Lt. G. W. A. Brown, Spec. Res., from an Assist. Equipment Officer, and to be temp. Capt. whilst so emplyd., Aug. 19th.

Flying Officers.—Temp. Sec. Lt. G. W. Howland, R. Ir. Rif., and to be transfd. to Gen. List; Sec. Lt. G. D. Rae, Spec. Res.; Sec. Lt. A. J. Winstanley, Spec. Res., Aug. 28th. Sec. Lt. D. M. Bisset, Gord. Highrs., T. F.; Sec. Lt. M. A. Seymour, Spec. Res.; temp. Sec. Lt. C. G. Baker, Gen. List; Sec. Lt. G. H. Jacob, Spec. Res.; Sec. Lt. J. W. Baillie, Spec. Res.; Sec. Lt. P. S. Butterworth, Spec. Res.; Sec. Lt. D. S. Evans, Spec. Res., Aug. 31st.

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Temp. Sec. Lt. (on prob.) G. F. Campbell, High. L.I., and to be transfd. to Gen. List, Sept. 1st. Lt. A. D. Whitehead, R. War. R., and to be sec'd., Sept. 2nd.

Flying Officer (Observer).—Temp. Sec. Lt. J. B. Hinchcliff, 10th Yorks L.I., and to be transfd. to Gen. List, June 12th. The appt. of temp. Sec. Lt. J. A. Hinchcliffe, Yorks L.I., as a Flying Officer (Observer), notified on July 7th, is cancelled. Temp. Capt. G. Dixon-Spain, R. Fus., and to be transfd. to Gen. List, Lt. R. H. Martin, 18th Canadian Infy. Bn.; Sec. Lt. H. J. Hamilton, D. of Corn. L.I., and to be sec'd., Aug. 30th.

Balloon Officers.—Sec. Lts., Spec. Res.:—E. G. Boulenger, L. S. S. Northcote, Aug. 12th.

Asst. Equipment Officers.—Sec. Lts., Spec. Res.—T. Morrison, July 5th. H. H. W. Vowden, H. E. L. Pilbrow, G. A. Lawlor, E. G. Herbert, L. Stones, Aug. 31st.

MEMORANDA.—To be temp. Sec. Lts. for duty with R.F.C.:—First Cl. Air Mech. G. W. Charley, from R.N.A.S., Cdt. J. M. Mitchell, from 2nd Artists Rif. O.T.C., Aug. 21st. 2nd Cl. Air Mech. H. Nankivell, from R.F.C., to be temp. Sec. Lt. for duty with the Mil. Wing of that Corps, Sept. 13th.

VOLUNTEER FORCE.—CITY OF LONDON VOLUNTEER REGT.—Temp. Lt.-Col. Sir Charles Cheers Wakefield to be temp. Col.

* * *

From the "London Gazette" Supplement, Sept. 28th, 1916.

WAR OFFICE, Sept. 28th.

REGULAR FORCES.—N.C.Os. to be Sec. Lts. for service in the field:—

MEMORANDA.—For duty with R.F.C.:—Sgt. C. E. Morgan, from R.F.C., July 12th. Pte. J. T. Gibbon, from A.S.C., Aug. 15th. Sgt. G. Lacey, from R.F.C., L.-Sgt. E. M. Henderson, from Lond. R., T.F., Cpl. J. H. A. Byrne, from R.F.C., 2nd Cl. Air Mech. C. W. O'Neill-Ready, from R.F.C., Aug. 17th. 1st Cl. Air Mech. S. Mercer, from R.F.C., Aug. 21st. Sgt. J. E. Macloghlin, from R.F.C., Aug. 22nd. Pte. F. G. Thierry, from Lond. R., T.F., Aug. 25th. Sgt. P. C. Hollingsworth, from H.A.C., T.F., Aug. 26th. Fl. Sgt. B. E. Hobbs, from R.F.C., Aug. 27th. Armr.-Sgt. A. E. Godfrey, 1st Canadian Pioneer Bn., Pte. C. H. P. Ewbank, from Lond. R., T.F., Aug. 28th. Sapper W. T. Jourdan, from 2nd Canadian Tunnelling Co., Aug. 29th.

COMMANDS AND STAFF ATTD. TO HDQRS. UNITS.—Brig.-Comm., and to be temp. Brig.-Gen. whilst so empld., Bt.-Maj. C. A. H. Longcroft, Welsh R., from temp. Lt.-Col. and Wing Comdr., R.F.C.; Brig.-Major Capt. H. N. Walker, Welsh R., Aug. 27th, 1916. Aug. 28th, 1916.

Staff Capt.—Capt. J. A. M. Lang, Notts and Derby R., from Adj., R.F.C., Lt. (temp. Capt.) R. H. Jerman, R.W. Fus., from Adj., R.F.C., and to retain his temp. rank whilst so empld., vice Capt. H. N. Walker, Welsh R.

ESTABLISHMENTS.—R.F.C.—Squadron Comdr.—Lt. (temp. Capt.) J. A. Cunningham, R.A., from a Flight Comdr., and to be temp. Maj. whilst so empld., Sept. 1st.

Flight Comdrs.—From Flying Officers. and to be temp. Capt. whilst so empld.—Lt. E. W. Farrow, Machine Gun Serv., Canadian Local Forces, September 15th. Temp. Sec. Lt. E. T. Farrow, Gen. List, Sept. 18th. Temp. Lt. G. B. Hodgson, Gen. List, Sept. 19th.

Flying Officers.—Sec. Lt. E. L. French, R. Ir. Rif., Spec. Res., and to be sec'd.; Sec. Lt. O. Nixon, Essex R., and to be sec'd.; temp. Sec. Lt. F. F. Organ, Gen. List, from a Flying Officer (Observer), seny. from April 29th; Sec. Lt. F. C. Deane, Spec. Res.; temp. Sec. Lt. W. Cochrane, Gen. List; temp. Sec. Lt. F. B. Luget, Gen. List; Sec. Lt. R. M. Neill, Spec. Res.; Sec. Lt. C. H. Bell, Spec. Res., Aug. 23rd. Temp. Sec. Lt. I. E. M. Mackenzie, Gen. List, Aug. 27th. Lt. W. R. Gayner, 17th Canadian Inf. Bn., Aug. 28th. Lt. R. S. Brown, Australian F.C., Aug. 29th. Sec. Lt. G. S. Bozman, R. W. Surr. R., T.F., Aug. 30th. Sec. Lt. A. P. Davidson, High. L.I., and to be sec'd., Sec. Lt. D. R. C. Gahell, Glouc. R., and to be sec'd., Sept. 1st. Sec. Lt. (temp. Capt.) A. G. Saxty, Som. L.I., T.F., Sec. Lt. (temp. Lt.) J. M. J. Spencer, North'd Fus., T.F., Sept. 3rd. Temp. Lt. J. B. Lawton, E. Kent R., and to be transfd. to Gen. List, Sept. 5th. Temp. Lt. W. G. B. McKechnie, Gen. List, from a Flying Officer (Observer), seny. from April 29th. Lt. S. H. Starey, Shrops. L.I., Spec. Res., and to be sec'd., Temp. Sec. Lt. B. W. Hill, Rif. Brig., and to be transfd. to Gen. List, Temp. Sec. Lt. (temp. Lt.) I. G. Davies, Gen. List, from a Flying Officer (Observer), seny. from Feb. 1st. Temp. Sec. Lt. A. J. Court, Gen. List, Temp. Sec. Lt. S. N. Williams, Gen. List, Sec. Lt. E. J. Roberts, Spec. Res., Sept. 9th.

Balloon Officers.—Capt. V. O. Todd, R. Lanc. R., and to be sec'd., Temp. Sec. Lt. O. Williams, High. L.I., and to be transfd. to Gen. List, Temp. Sec. Lt. S. C. Shepherdson, Welsh R., and to be transfd. to Gen. List, Sec. Lt. A. J. Johnston, Spec. Res., Sec. Lt. C. J. R. Milton, Spec. Res., Sec. Lt. C. McM. Russell, Spec. Res., Aug. 28th. Capt. W. J. Alexander, Devon R., Sec. Lt. (temp. Lt.) A. Law, Arg. and Suth'd Highrs., T.F., Temp. Lt. (Sec. Lt., Welsh Brig., R.F.A., T.F.) R. H. N. Lomax, Machine Gun Corps, and to be transfd. to Gen. List, Temp. Sec. Lt. W. A. Dunn, Arg. and South'd Highrs., and to be transfd. to Gen. List, Temp. Sec. Lt. K. C. Campbell, Bord R., and to

be transfd. to Gen. List, Sec. Lt. (on prob.) F. B. B. Shand, Spec. Res., Sept. 11th.

Adjts.—Lt. (temp. Capt.) B. H. Bonham-Carter, 40th Pathans, Ind. Army, Sept. 1st. Capt. H. C. C. Morley, E. Kent R., and to be sec'd., vice Capt. J. A. M. Lang, Notts. and Derby R., Aug. 27th.

MEMORANDA.—To be temp. Lts.:—Sec. Lt. W. G. Stewart, R.F.C., Spec. Res., from a Flying Officer, Sgt. J. W. Matthews, from a Divisional Sig. Co., R.E., Sept. 29th.

Cadet W. J. King, from Cadet School O.T.C., M.T., A.S.C., to be temp. Sec. Lt. for duty with R.F.C., Sept. 6th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in rank:—E. J. Roberts, C. McM. Russell, C. J. R. Milton, A. J. Johnston, G. L. Bond, H. F. Chapman, R. S. Janeson.

To be Sec. Lts.:—R. J. Cowan, July 9th. R. A. Hassard, C. H. Boyle, Aug. 14th. To be Sec. Lts. (on prob.):—P. R. Hutchinson, Aug. 19th. A. C. Smith, Aug. 21st.

TERRITORIAL FORCE.—YEOMANRY.—LON. DIVL. CYC. CO.—Sec. Lt. W. J. Corbishley is sec'd. for duty with the R.F.C., Aug. 24th.

INFANTRY.—SCOT. RIF.—Lt. G. Nelson is sec'd. for duty with the R.F.C., Aug. 24th.

* * *

From the "London Gazette," Sept. 29th, 1916.

WAR OFFICE, Sept. 29th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Wing Comdr.—Capt. (temp. Maj.) P. H. L. Playfair, R.A., from a Sqdn. Comdr., and to be temp. Lt.-Col. whilst so empld., vice Bt. Maj. (temp. Brig.-Gen.) C. A. H. Longcroft, Welsh R., Aug. 28th.

Flight Comdrs.—Capt. M. G. B. Copeman, Leic. R., from a Flying Officer; from Flying Officers, and to be temp. Capt. whilst so empld.—Temp. Lt. P. G. Scott, Gen. List; Sec. Lt. (temp. Lt.) M. T. Baines, R. Wilts. Yeo., T.F.; temp. Sec. Lt. W. R. E. Harrison, Gen. List, Sept. 1st. Sec. Lt. T. Maxwell-Scott, Spec. Res., Sept. 12th.

MEMORANDUM.—Pte. F. J. K. Mason, from Lond. R., T.F., to be temp. Sec. Lt., for duty with R.F.C., Sept. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Lord E. A. Grosvenor, late Flt. Comdr. R.F.C., Naval Wing (R.N.A.S.), to be Capt., Aug. 28th. Sec. Lt. (on prob.) C. F. Ring resigns his commn. on account of ill-health, Sept. 30th. Sec. Lt. C. Fergusson resigns his commn., Sept. 30th. Sec. Lt. (on prob.) F. G. Parsons is confirmed in his rank. To be Sec. Lts. (on prob.):—E. E. Moodey, Sept. 3rd. E. S. Halford, C. Curwen, A. Hingston, R. W. Davies, C. C. Bracebridge, E. Holloway, Sept. 6th. T. Cooper, Sept. 7th.

TERRITORIAL FORCE.—YEOMANRY.—COUNTY OF LOND.—Sec. Lt. H. I. Bell is sec'd. for duty with the R.F.C., Aug. 25th.

R.F.A.—LOWLAND BDE.—Sec. Lt. (temp. Lt.) N. MacL. Robertson is sec'd. for duty with the R.F.C., Aug. 23rd, instead of as previously notified.

S. MIDLAND BDE.—Sec. Lt. G. J. H. Lascelles is sec'd. for duty with the R.F.C., Sept. 12th.

NORTHUMBRIAN BDE.—Sec. Lt. (temp. Capt.) W. Wallace is now sec'd. for duty with the R.F.C., Aug. 28th.

R.E.—HOME COS. DIVL. ENGRS.—Sec. Lt. H. J. Finer is sec'd. for duty with the R.F.C., Sept. 7th. Sec. Lt. W. H. Holman relinquishes his commn., Sept. 30th.

* * *

From the "London Gazette" Supplement, Oct. 2nd, 1916.

WAR OFFICE, Oct. 2nd.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdrs.—And to be temp. Capt. whilst so empld.:—Temp. Lt. J. B. Quested, Gen. List, from a Flying Officer, Sec. Lt. (on prob.) B. H. Sisson, R.G.A., Spec. Res., from a Balloon Officer, Sec. Lt. A. M. Vaucour, R.A., from a Flying Officer, Sept. 15th. Sec. Lt. (temp. Lt.) T. L. Purdon, K.O. Sco. Bord., T. F., from a Flying Officer, Sept. 20th.

Flying Officers.—Lt. (now Capt.) R. B. Bourdillon, Spec. Res., from an Asst. Equipment Officer, from May 15th to June 8th. Temp. Lt. F. O. Troup, R. Innis, Fus., and to be transfd. to Gen. List, Aug. 29th. Sec. Lt. (temp. Capt.) A. G. Deuchar, Northern Cyclist Bn., T.F., Lt. E. M. Lugard, R. Lanc. R., and to be sec'd., Lt. A. Ferris, R. Ir. Rif., Spec. Res., and to be sec'd., Temp. Sec. Lt. (on prob.) G. D. Buckeridge, K. R. Rif. C., and to be transfd. to Gen. List, Sept. 7th. Temp. Sec. Lt. M. A. E. Cremetti, R. Sco. Fus., and to be transfd. to Gen. List, Sec. Lt. G. W. Gillespie, Midd'x R., T.F., Sec. Lt. H. F. Evans, Berks R. Horse Art., T.F., Sept. 8th. Sec. Lt. D. W. Forshaw, Brecknockshire Bn., S. Wales Bord, T.F., Sec. Lt. J. W. D. Leigh, Northern Cyclist Bn., T.F., Sec. Lt. F. G. Parsons, Spec. Res., Sept. 9th. Temp. Lt. A. Duguid, Gen. List, from a Flying Officer (Observer), Sept. 10th, sen. from Feb. 17th.

Balloon Officers.—Temp. Capt. B. White, High L.I., and to be transfd. to Gen. List, Sec. Lt. (temp. Capt.) W. Wallace, Northbn. Brig., R.F.A., T.F., Temp. Lt. L. D. A. Dircks, Lond. R., T.F., Temp. Lt. R. M. Plummer, Bedf. R., T.F., Temp. Lt.

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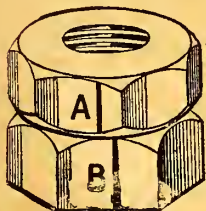
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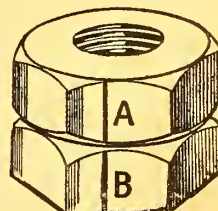
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

R. P. Sewell, Essex R., and to be transfd. to Gen. List, Lt. N. R. Mossop, Suff. R., Spec. Res., and to be sec'd. Temp. Sec. Lt. F. S. Wallis, R. War. R., and to be transfd. to Gen. List, Sec. Lt. (on prob.) D. P. Farrant, R. Fus., Spec. Res., and to be sec'd., Sec. Lt. G. L. Bond, Spec. Res., Temp. Sec. Lt. P. J. Scales, Hamps. R., and to be transfd. to Gen. List, Sec. Lt. H. F. Chapman, Spec. Res., Sec. Lt. R. S. Jameson, Spec. Res., Aug. 28th.

Adjts.—Capt. G. B. Fraser, 2nd Regt., King Edward's Horse, Spec. Res., and to be sec'd., Aug. 12th. Temp. Sec. Lt. (temp. Lt.) G. R. Moser, Arg. and Suth'd. Highrs., from a Flying Officer (Observer), Sept. 18th.

Asst. Equip. Officers.—Sec. Lt. H. I. Bell, 3rd Co. of Lond. Yeo., T.F., Aug. 25th. Temp. Sec. Lt. P. M. H. Currie, Gen. List, Sept. 1st. Sec. Lt. (on prob.) G. L. Main, Spec. Res., Sept. 9th. Sec. Lt. (temp. Capt.) W. T. Taylor, 12th N. Lan. R., T.F., Temp. Sec. Lt. A. D. Goodwin, Gen. List, Sept. 10th. Temp. Sec. Lt. H. J. Brambley, Worc. R., and to be transfd. to Gen. List, Temp. Sec. Lt. (on prob.) L. C. Atwood, Rif. Brig., and to be transfd. to Gen. List, Temp. Sec. Lt. P. P. Capelli, Gen. List, Sec. Lt. (on prob.) C. W. Barnsley, Spec. Res., Sec. Lt. (on prob.) J. J. Bartlett, Spec. Res., Sec. Lt. (on prob.) R. E. Chaderton, Spec. Res., Temp. Sec. Lt. G. W. Charley, Gen. List, Sec. Lt. (on prob.) R. W. Mitcheil, Spec. Res., Temp. Sec. Lt. F. A. Cobb, R.A., and to be transfd. to Gen. List, Sec. Lts. (on prob.), Spec. Res., D. L. Hollis, W. G. Cooke, C. R. Fleming-Williams, F. O. Gibbon, J. Goodenough, M. R. Grover, P. H. S. Gwilliam, C. J. W. Hosken, A. W. McAuslane, H. Whitehead, Temp. Sec. Lt. A. B. Wiggin, Gen. List, Sec. Lts. (on prob.) Spec. Res., T. A. B. Rolfe, E. C. McKenzie-Martyn, Temp. Sec. Lt. J. M. Mitchell, Gen. List, Sec. Lts. (on prob.), Spec. Res., G. E. Osmond, M. F. A. Paine, R. R. Richards, R. T. Royle, A. C. Smith, H. N. Stradling, H. Tallis, D. B. Thorp, E. M. A. Van der Meersch, J. Wheatland-Clinch, A. E. Squire, Sept. 11th.

MEMORANDUM.—Lt. A. B. Wiggin, from a Cadet Bn., R. War. R., to be temp. Sec. Lt. for duty with R.F.C., Aug. 21st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Following resign their commns.:—Lt. (temp. Capt.) W. H. Furlonger, Sec. Lt. (on prob.) A. Brown, Oct. 3rd. Sec. Lt. A. Goulding resigns his commn. on account of ill-health, Oct. 3rd.

The undermentioned candidates nominated for Commissions in the Regular Army under paragraph 3 of Army Order 333 of 1915, and Army Order 174 of 1916, to be Sec. Lts., and to retain their seniority in their present units until ordered to join a Regular unit, Oct. 3rd, 1916, with seniority as from Sept. 4th, 1916:—

INFANTRY.—W. RID. R.—Sec. Lt. Ernest Edward Bush, from R.F.C., Spec. Res.

S. LAN. R.—Sec. Lt. Alfred Gordon Bond, from R.F.C., Spec. Res.

TERRITORIAL FORCE.—R.F.A.—NORTHUMBRIAN BRIG.—Sec. Lt. P. F. Heppell is sec'd. for duty with the R.F.C., Sept. 7th.

WESSEX BRIG.—Lt. R. P. Sparrow is sec'd. for duty with the Anti-Aircraft Depot, Shoburyness, Sept. 25th.

R.G.A.—HAMS.—Lt. (temp. Capt.) M. D. W. E. B. Leven is sec'd. for duty with the Anti-Aircraft Depot, Oct. 3rd.

LOND.—Capt. (temp. Maj.) S. Low to be Maj., Lt. E. C. Harrison is sec'd. for duty with the Anti-Aircraft Brig., Oct. 3rd.

R. SCOTS.—Lt. N. W. Stewart is sec'd. for duty with the R.F.C. INFANTRY.—NORTH. FUS.—Sec. Lt. (temp. Lt.) J. M. J. Spencer is sec'd. for duty with the R.F.C., Sept. 3rd.

SOMERSET L.I.—Sec. Lt. (temp. Capt.) A. G. Saxby is sec'd. for duty with R.F.C., Sept. 3rd.

CHES. R.—Sec. Lt. S. Crosfield is sec'd. for duty with R.F.C., Aug. 24th.

DEVON R.—Sec. Lt. G. T. Beer is sec'd. for duty with the R.F.C., Sept. 4th.

S. WALES BORD.—Sec. Lt. D. W. Forshaw is sec'd. for duty with the R.F.C., Sept. 9th.

LOYAL N. LANCS. R.—Sec. Lt. (temp. Capt.) W. T. Taylor is sec'd. for duty with R.F.C., Sept. 10th.

MIDD'X R.—Sec. Lt. G. W. Gillespie is sec'd. for duty with R.F.C., Sept. 8th.

ARG. AND SUTH. HIGHRS.—Sec. Lt. (temp. Lt.) A. Law is sec'd. for duty with R.F.C., Sept. 11th.

LOND. R.—Sec. Lt. E. C. Stringer is sec'd. for duty with R.F.C., Aug. 31st.

NORTHERN CYCLIST BN.—The following are sec'd. for duty with R.F.C.:—Sec. Lt. (temp. Capt.) A. G. Deuchar, Sept. 7th. Sec. Lt. J. W. D. Leigh, Sept. 9th.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

SEPT. 26th.—Chief Petty Officer L. F. Creese granted a temp. commission as Sub-Lt., R.N.V.R., with seniority Sept. 24th.

SEPT. 29th.—Flt. Lieut.—G. F. Breese, granted act. rank of Flt. Commr., seny. Sept. 25th.

The following have been entered as Proby. Flt. Officers (temp.), seny. Oct. 1st:—E. F. Dixon, R. A. G. Hill, and R. H. Catleugh.

THE R.F.C. OF THE FUTURE.



God Speed



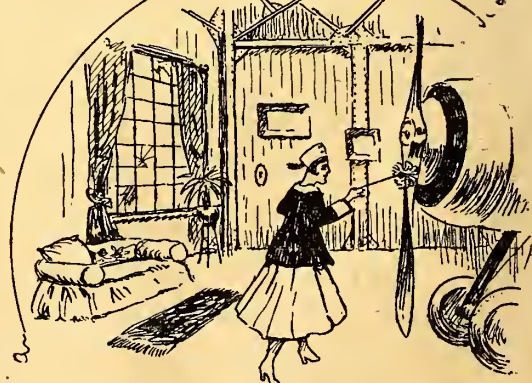
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Preparing for a flight



The Flight-Sub off on Week End leave



The girls take charge of the Hangars

A sketch by a reader suggested by the importation of feminine drivers into the R.F.C. One fears that the artist belongs to the Senior Service, judging by a solecism which appears in his inscription to the lower left hand picture.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Temp. commissions (R.N.V.R.) have been granted to the following, seny. Sept. 27th:—Lieut.—J. W. Eckford; Sub-Lieuts.—T. Terrell, A. W. Dow, and H. W. Eades; and Petty Officer J. D. Whitelaw.

SEPT. 29th.—Proby. Flt. Sub-Lt.—I. J. Springfield, granted a temp. commission as Sub-Lt. (R.N.V.R.), seny. Sept. 28th, and apptd. to "President," for R.N.A.S. (appt. as Proby. Flt. Sub-Lt. terminated).

The following have been entered as Proby. Flt. Officers (temp.), seny. Oct. 1st, and apptd. to "President," addl., for R.N.A.S.:—G. Goodhart, A. G. H. Brett, J. F. Nalder, J. E. L. Hunter, S. A. Bowyer, and G. B. S. McBain.

Messrs. J. H. Hagon, A. C. Baker, and J. W. C. Dobbyn, all granted temp. commissions as sub-Lts. (R.N.V.R.), seny. Sept. 28th, and apptd. to "President," for R.N.A.S.

Oct. 3rd.—Flt. Comdr.—C. M. Murphy, granted act. rank of Squadron Comdr., seny. Sept. 28th.

Act. Flt. Lt.—D. Gill, to rank of Flt. Lt., seny. Oct. 1st.

Flt. Sub-Lts.—R. Souray, C. V. Arnold, L. H. Wilkins, R. Young, R. M. Clifford, W. L. Graham, J. C. Croft, the Hon. N. G. H. Sturt, T. P. G. Moore, P. E. Maitland, P. G. M. Ommány, W. Underhill, C. W. C. Browne, C. B. C. Swayne, A. H. Wann, T. W. Elmhirst, W. P. C. Chambers, I. C. Little, C. C. R. Edwards, H. McClelland, G. A. Gooderham, S. J. Goble, G. Preen, W. R. Mackenzie, all to rank of Flt. Lt., seny. Oct. 1st.

Act. Flt. Lts. (Temp.).—B. E. P. Gregg and S. O. Smith, both to rank of Flt. Lt., seny. Oct. 1st.

Flt. Sub-Lts. (Temp.).—C. C. Carlisle, O. A. Butcher, H. E. Crawford, W. H. Sharpe, R. W. Lane, A. E. Hawker, I. H. W. Barnato, A. N. Gallehawk, W. M. Tait, G. E. Hervey, M. R. Buckland, R. S. de Q. Quincy, H. G. Travers, L. A. T. Pritchard, C. A. Rea, C. A. Eyre, F. S. McGill, F. E. Sandford, F. N. Halsted, N. Keeble, A. A. Wallis, F. D. H. Brenner, M. Bartlett, and C. W. Jamieson, all to rank of Flt. Lt. (temp.) seny. Oct. 1st.

Flt. Sub-Lt. (Temp.).—A. N. Gallehawk, apptd. Act. Flt. Lt. (temp.), seny. Oct. 1st.

The following have entered as Proby. Flt. Sub-Lts. (temp.), seny. as stated:—D. M. Shields, Aug. 22nd. A. R. Knight, Aug. 26th., and C. W. Bailey, Sept. 1st.

Sub-Lt. (Temp.) (R.N.V.R.).—J. Weston, apptd. Act. Lt. (R.N.V.R., temp.), seny. Sept. 28th.

* * *

The following communiqué was issued by the Secretary of the Admiralty on Sept. 27th:—Attacks were carried out this morning on the enemy airship sheds at Evere, Berchem St. Agathe, and Etterbeck, near Brussels, by naval aeroplanes.

Bombs were observed to straddle the sheds, which were apparently hit. Bombs dropped at Evere struck buildings, presumably ammunition stores, in close proximity to the sheds. Heavy explosions and large volumes of smoke were observed.

All machines returned safely.

[The airship sheds at Evere and Berchem have both been bombed by British aviators on several occasions, and if previous accounts of destruction have been correct, they must grow new ones very rapidly. That at Evere, near Brussels, was hit by eight bombs on August 9th last, and over a year ago the LZ38 was destroyed in an airshed at the same place. The airshed at Berchem was attacked in April, 1915, when both the shed and the airship within it were seriously damaged.—Ed.]

* * *

THE CASUALTY LIST.

Reported Sept. 27th.

ACCIDENTALLY KILLED.—Flt. Sub-Lt. James D. Scott, R.N.

ACCIDENTALLY INJURED.—Prob. Flt. Sub-Lt. Robert A. Campbell, R.N.

SLIGHTLY INJURED.—Flt. Lt. Egbert Cadbury, R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Actg. Flt. Comdr. George H. Beard, D.S.C., R.N.

Reported Oct. 2nd.

ACCIDENTALLY KILLED.—Proby. Flt. Sub-Lieut. Patrick S. Kennedy, R.N.

INJURED.—Flt. Lt. Norman W. G. Blackburn, R.N.

Proby. Flt., Sub-Lt. Edward L. Lister, R.N.

SLIGHTLY INJURED.—Proby. Flt. Sub-Lt. Sydney E. G. Lees, R.N.

* * *

On September 29th a small Naval airship flew over the West-end as far as the Admiralty, apparently for the purpose of an inspection, as it manœuvred in the vicinity for a short time and departed, apparently, whence it came.

* * *

Dave Lazarus, 25, carpenter, on being charged at North London Police Court with failing to report for service, said he was a conscientious objector except in regard to the Royal Naval Air Service, which he was willing to join. He was fined £5, with the alternative of a month's imprisonment.

[Rather rough on the R.N.A.S.—Ed.]

PERSONAL NOTICES.

DEATHS.

BANKES-PRICE.—In proud and loving memory of Flt. Lt. John Thearsby Bankes-Price, R.N., killed in an aero-combat with the enemy on Sept. 17th, only son of the late William H. and Mary E. Bankes-Price, and dearly loved nephew of Evelyn and Florence Bankes-Price, aged 21.

Pro Libertate Patriæ.

* * *

BEARD.—George Henry Beard was born at West Ham in Nov. 1886. He took his certificate, No. 1095, on a Wright biplane at the Beatty School at Hendon on Feb. 20th, 1915. He offered his services to the R.N.A.S. and to the R.F.C., but was turned down, chiefly on account of his age. Refusing to be discouraged by official lack of appreciation, he gamely went and learned to fly at his own expense.

Having joined the school and having acquired the ability to fly he again went and offered himself, as almost a full-blown pilot, to the R.N.A.S. On this occasion he met with a more intelligent reception and was appointed on probation just before taking his certificate.

After being confirmed in his rank he proved to be most able and hardworking, and a sound, reliable pilot. Most of his work has been done in Flanders, and on active service he showed himself to be a highly valuable officer, winning the affection and regard of brother officers and men alike. Everyone in his squadron was as delighted as he when the Distinguished Service Cross was awarded to him for general all round good work. He will be deeply regretted by all who served with him or knew him.

ENGAGEMENTS.

FITZHERBERT—LOWNDES.—A marriage will shortly take place between Flt. Sub-Lt. Cecil Henry FitzHerbert, R.N.A.S., youngest son of Mr. and Mrs. Henry Corry FitzHerbert, of Abbeylax, Ireland, and Ellen Katharine (Kitty), eldest daughter of Mr. and Mrs. Walter Lowndes, of Broomfield, Hoylake, Cheshire.

* * *

HILL—McKEGG.—The engagement is announced of Miss M. McKegg, the only daughter of Captain and Mrs. McKegg, of Liverpool, to Flt. Sub-Lt. W. R. M. Hill, R.N., eldest son of Captain and Mrs. Hill, of Hove, Sussex.

* * *

McHARDY — SHULDHAM-LEGH.—An engagement is announced between Flt. Sub-Lt. Graham Goodenough McHardy, R.N., younger son of Captain Hardy McHardy, R.N., late Chief Constable of Ayrshire, and Frances Valencia, only daughter of the late Colonel Harry Shuldham-Legh, M.V.O., and Mrs. Shuldham-Legh, of Heather Brae, East Liss.

BIRTH.

GROVES.—On Sept. 24th, at 1, Chester Gate, N.W., the wife of Flt. Lt. Peer Groves, of Knutsford—a daughter.

MILITARY.

G.H.Q. COMMUNIQUÉS

SEPT. 27th, 1.4 p.m.—Three hostile aeroplanes were destroyed in air fighting on the 25th inst., and six others driven down damaged.

11.0 p.m.—Two enemy aeroplanes and two kite balloons were destroyed by us yesterday. Two of our machines are missing.

SEPT. 28th, 10.50 p.m.—British aeroplanes have, as usual, during the past few days co-operated brilliantly with the infantry. Much damage has been done to enemy batteries, and there have been many instances of our aeroplanes attacking troops and transport on the ground with machine-gun fire.

SEPT. 29th, 11.47 a.m.—North of Ypres and south-east of Bapaume our aeroplanes observed a huge explosion, as if a large ammunition dump had blown up. The smoke ascended to 9,000 ft.

10 p.m.—In spite of the weather, our aeroplanes have done useful work attacking enemy reinforcements on the move.

Yesterday enemy aircraft patrolled actively behind their own lines but showed little offensive enterprise.

One enemy machine was destroyed and one of our own has not returned.

SEPT. 30th, 11.50 p.m.—On the 28th two enemy aeroplanes were brought down, in addition to the one mentioned in last night's report.

OCT. 1st, 10.15 p.m.—Yesterday two of the enemy's aerodromes were successfully bombed by our aeroplanes, and at least one machine destroyed.

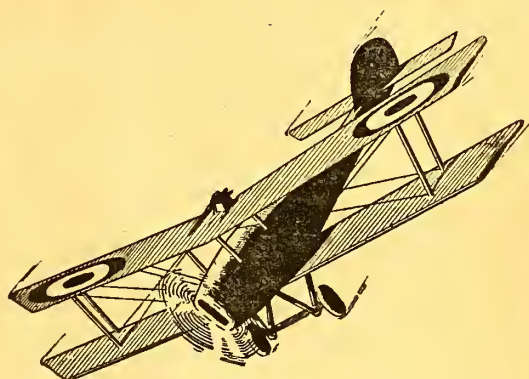
In the fighting over the front four enemy machines were brought down, and one of our own is missing.

Enemy troops and transport have been repeatedly attacked from the air with machine-gun fire, and in one case several hundred infantry were dispersed.

An enemy kite balloon was brought down in flames.

There were many fights in the air, in the course of which two enemy machines were destroyed and many others driven down. We suffered no losses.

Contractors
H.M. ADMIRALTY
and
WAR OFFICE



Telegrams: "Martinsyde, Weybridge"



Telephone: 171 Byfleet.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

OCT. 2nd, 11.2 p.m.—During yesterday's operations our aeroplanes bombed several points of military importance.

WAR OFFICE COMMUNIQUÉS.

SEPT. 26th.—The General Officer Commanding the British Forces at Salonika reports:—(Doiran Front) Hostile artillery and aircraft displayed considerable activity. Our aircraft engaged enemy machines on three occasions and drove them off.

SEPT. 28th.—The General Officer Commanding the British Forces at Salonika reports:—The enemy's aircraft has been very active, and it is reported that one machine was brought down by our fire.

The railway station at Angista was bombed by aeroplanes of the R.N.A.S.

SEPT. 29th.—The General Officer Commanding the British Forces in Mesopotamia makes the following report:—

TIGRIS LINE.—Our aeroplanes bombed the enemy's aerodrome on the morning of the 23rd inst. and again on the 27th apparently with good effect.

SEPT. 29th.—The General Officer Commanding the British Forces at Salonika reports:—

Enemy aircraft displayed considerable activity.

OCT. 1st.—The General Officer Commanding the British Forces at Salonika reports on the Struma front the Royal Navy shelled and dispersed an enemy column east of Neohori, and aeroplanes of the R.N.A.S. bombed Angista Railway Station.

* * *

HOME COMMAND COMMUNIQUÉS.

SEPT. 26th, 12.10 p.m.—Seven airships carried out a raid on England last night and in the early hours of this morning.

The districts attacked were the South Coast, East Coast, North-East Coast, and North Midlands.

The principal attack was aimed against the industrial centres in the last-mentioned area.

Up to the present no damage to factories or works of military importance has been reported.

It is regretted, however, that a number of small houses and cottages were wrecked or damaged in some places, and 29 deaths have been reported.

No attempt was made to approach London.

The raiders were engaged by the Anti-Aircraft Defences, and were successfully driven off from several large industrial centres.

5.20 p.m.—In the raid of last night the total casualties so far reported are: killed, 36; injured, 27.

Very slight damage was caused and none whatever of military importance.

SEPT. 26th, 5.20 p.m.—AIR RAID, Sept. 23rd-24th.—It has now been established that the two airships brought down in this raid were the Naval Zeppelins "L32" and "L33." Both were of very recent construction.

The first airship was finally destroyed by an aeroplane after passing through effective gunfire. The second airship was hit by gunfire from the London Defences and forced to descend in Essex through loss of gas.

Owing to deaths from injuries having occurred and to casualties not having been reported to the police immediately, some amendment must be made to the list of casualties caused during the raid on the night of Sept. 23rd-24th. Corrected figures are as follows:—

Killed: 23 men, 12 women, 3 children. Total, 38.

Injured: 56 men, 43 women, 26 children. Total, 125.

OCT. 1st, 11.45 p.m.—A number of hostile airships crossed the East Coast between 9 p.m. and midnight.

A few bombs have been dropped near the coast, but no damage has yet been reported. The raid is still in progress, and some airships are in the vicinity of London, where some guns have been in action.

Addendum:—

An airship is just reported to have been brought down in flames north of London.

10.30 a.m.—Ten hostile airships crossed the East Coast last night between 9 p.m. and midnight.

One airship approached the north of London about 10 p.m., but was driven off by gunfire and pursued by aeroplanes.

She attempted to return from the north-west, but was attacked by guns and aeroplanes and brought to earth in flames in the neighbourhood of Potter's Bar shortly before midnight.

A second airship attempted to attack London from the north-east, but was driven off about 1 a.m.

A number of bombs were dropped, but no reports of casualties or damage have yet been received.

The remaining airships wandered aimlessly over the Eastern counties and Lincolnshire.

Bombs were dropped promiscuously, but most of them appear to have dropped in the open country, without doing any damage.

The airship destroyed was of the latest type.

OCT. 2nd, 4.5 p.m.—Police reports show that the total casualties as a result of last night's raid were one man killed and one woman injured.

The material damage was insignificant, although the raiders covered a wide area and dropped a great number of bombs.

Four houses were seriously damaged, some glass-houses were demolished, and a number of windows were broken.

THE CASUALTY LIST.

Reported Sept. 27th.

KILLED.—R.F.C.—Anderson, 8864, Sec. Cl. Air Mech. R.

WOUNDED.—R.F.C.—Woodcock, 4258, First Cl. Air Mech. H. W. (Norwich).

MISSING.—R.F.C.—Clarkson, 1565, Flt. Sgt. N. C. (Bedford Park, W.); Walker, 2260, Sgt. A. (Leshmahagow).

Reported Sept. 28th.

WOUNDED.—Cathie, Sec. Lt. A. J., R.F.C.

MISSING.—Tower, Capt. H. C., R.F.C.

PREVIOUSLY REPORTED BELIEVED TAKEN PRISONER AT KUT-EL-AMARA, NOW REPORTED PRISONER.—R.F.C.—Snell, 4351, Sec. Cl. Air Mech. F.

Reported Sept. 29th.

MISSING.—Carter, Sec. Lt. R. N., Dorset Regt., attd. R.F.C.

Gray, Sec. Lt. W. J., R.F.C.

Reported Sept. 30th.

KILLED.—Hardman, Lt. C. W., Middlesex Regt., attd. R.F.C.

Higgins, Sec. Lt. C. D., R.F.C.

Morgan, Sec. Lt. L. V., E. Kent Regt., and R.F.C.

WOUNDED.—Baines, Sec. Lt. C., York and Lancs. Regt., attd. R.F.C.

Walker, Sec. Lt. A. R., Seaforth Highrs., attd. R.F.C.

MISSING.—Hunt, Sec. Lt. K. F., R.F.C.

Reported Oct. 1st.

DIED OF WOUNDS.—Hall, Sec. Lt. F., Dorset, attd. R.F.C.

MISSING.—Edwards, Sec. Lt. R. H., R.F.C.

Hedderwick, Sec. Lt. G., Dragon Guards, attd. R.F.C.

Herman, Sec. Lt. R. D., S. Lancs and R.F.C.

Hewson, Sec. Lt. F. A. A., Border, attd. R.F.C.

CORRECTION.—MISSING.—Elphinstone, Sec. Lt. C., R.F.C., should read Elphinstone.

Reported Oct. 2nd.

DIED OF WOUNDS.—Bentley, Lt. G. G., R.F.C.

Smyth, Sec. Lt. P. J., Connaught Rangers, attd. R.F.C.

WOUNDED.—Buller, Lt. J. A. R., R.F.C.

Forbes, Sec. Lt. L. F., R.F.C.

MISSING.—Godfrey, Sec. Lt. O. O., R.F.C.

Kenny, Lt. J. M. J., A.S.C. and R.F.C.

Roberts, Sec. Lt. E. J., R.F.C.

Tibbets, Sec. Lt. J. L., R.F.C.

Warn, Lt. W. G., R. Sussex and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMAN HANDS.—Bain, Sec. Lt. C. W., R.F.C.

PREVIOUSLY UNOFFICIALLY REPORTED PRISONER OF WAR, NOW OFFICIALLY REPORTED PRISONER OF WAR IN GERMAN HANDS.—Clements-Finnerty, Lt. H., R.F.C.

Reported Oct. 3rd.

KILLED.—Osmaston, Sec. Lt. R. S., R. Sussex Regt., attd. R.F.C.

MISSING.—Edwards, Sec. Lt. G., R.F.C.

West, Sec. Lt. T., Royal Engineers and R.F.C.

Wingfield, Sec. Lt. E. H., R.F.C.

* * *

On Oct. 1st as a military aeroplane was flying to an unnamed aerodrome it fell and was completely wrecked. The passenger was instantly killed and the pilot severely injured.

* * *

A British soldier on active service writes:—

"People in England cannot possibly have the faintest idea of what war is as we experience it. You have been in a Zepp. raid, and you can imagine something about a thousand times as bad, only continuing as long as you are in trenches, and the noise and din are indescribable. . . . It was funny to read of the fuss made over the Zepps, but there are hundreds of airmen who do twice as much every day. You ought to see combats in the air, and see our men calmly circling round German aeroplanes over German lines, pegging away at them with machine-guns, and bringing them down."

* * *

Mr. Philip Gibbs ("Times," Sept. 29th) describing the lone hand offensive carried out by a "Tank" in the capture of Thiepval, says:—

When the "Tank" went off on this excursion on its own account the Germans from one of the nearer trenches, after Goliath had passed, came running back to the British lines to surrender in sheer terror, and an aviator who was flying overhead gives an absurd description of the "Tank" marching majestically across country, its progress marked by an efflorescence of white handkerchiefs and similar emblems of surrender waved from the trenches. Unfortunately, a "Tank's" capacity for carrying prisoners is limited, and when the monster was seen to be in difficulties the enemy who had given themselves up changed their minds and fell upon it, with the results that have been told.

PERSONAL NOTICES.

DEATHS.

BROOKE-MURRAY.—On Sept. 23rd, at No. 7 Station Hospital, died of wounds received in action (Sept. 16th) in air combat against three enemy aviators, Kenneth Algernon Brooke-

Murray, Capt. A.S.C., attached R.F.C., in his twenty-fifth year, only and beloved son of Major and Mrs. Brooke-Murray, 7, Painswick Lawn, Cheltenham.

Capt. Brooke-Murray was educated at Cheltenham College (1906-10). At school he was a very good shot, and was in the Cheltenham Bisley Eight of 1908, 1909, and 1910. Entering Sandhurst in Sept., 1910, he was gazetted to the A.S.C. in 1911.

He went to France in Aug., 1914, with the first Expeditionary Force, and took part in all the operations of the 19th Brigade from Mons to the Marne and Aisne, Ypres, and Armentières. From April to July, 1915, he was adjutant of the advanced Horse Transport, and from July to Oct., 1915, he was Staff Captain, G.H.Q. Afterwards he became embarkation officer, Marseilles (Nov., 1915, to April, 1916), and officer to the Divisional Ammunition Park (April to June, 1916). He was then flying officer observer to the date of his death from wounds received in action on Sept. 16th in an air combat against three enemy aviators.

* * *

COOPER.—Lt. C. E. N. Cooper, Lincolnshire Regiment, attached R.F.C., whose death was briefly noted last week, in his 26th year, was the eldest son of Mr. and Mrs. Geo. C. Nooth Cooper, of South Norwood. He was educated at the Whitgift Grammar School, Croydon, and after six years' service in the Mercantile Marine he obtained an appointment with Messrs. Geo. Cradock and Co., wire rope makers, of Wakefield, Yorks.

He enlisted in the Queen Victoria Rifles in October, 1914, and obtained his commission in the Lincolnshire Regiment, Special Reserve, in February, 1915. In April, 1915, he was sent to the front and served there with his regiment until about three months ago, when he was lent to the R.F.C. as a Balloon Observation Officer. His death was caused by his parachute failing to act when compelled by an accident to descend from his balloon.

* * *

HARDMAN.—Lt. C. W. Hardman, R.F.C., who has been killed while flying at the front, was 28 years of age, and was the only son of Mr. and Mrs. Hardman, of Bengoe, Hertford Road, East Finchley. He was educated at East Finchley Grammar School and Christ College, Finchley. Before the war he held an appointment at Clerkenwell County Court, but left it to join the Seaforth Highlanders. After eight months' training he obtained a commission in the Middlesex Regiment. He went to the front about five months ago, and was given the position of trench mortar commander to the battalion. Mr. Hardman was transferred to the R.F.C. only about a week ago.

* * *

HIGGINS.—Killed in action, on Sept. 22nd, Sec. Lt. Claude D. Higgins, R.F.C., younger son of F. W. and Mrs. Higgins, Chittagong, India.

Mr. Higgins obtained his pilot's certificate in Aug., 1916, and went to the front a few days later. He had returned from India in the spring after having fulfilled his contract with Messrs. Hearty and Gresham, engineers, of Calcutta.

* * *

MACDONELL.—Lt. Ian Cameron Macdonell, R.F.C., reported missing on July 2nd, with Lt. Williamson, his observing officer, is now reported to have been killed in action on that date, his aeroplane being shot down.

He was the only surviving son of Brig.-Gen. A. C. Macdonell, C.M.G., D.S.O., commanding a Canadian Infantry Brigade, and Mrs. A. C. Macdonell. Born in Lethbridge, Alberta, in 1895, he was educated in Winnipeg, Manitoba. He obtained his brevet from the Royal Aero Club as a pilot in Dec., 1913, after passing through the Bristol School of Flying at Brooklands. Soon after the outbreak of war he was gazetted a lieutenant in his father's regiment, Lord Strathcona's Horse. In March, 1915, he became A.D.C. to Brig.-Gen. J. E. B. Seely, C.B., D.S.O., commanding the Canadian Cavalry Brigade, and served with them in the trenches, including the battle of Festubert, till he became attached, on probation, to the R.F.C. in Sept., 1915. He was gazetted flying officer on Nov. 6th of the same year. He met with a serious accident through the failure of his engine in Dec., 1915. His observer was killed and he himself more or less seriously injured. He reported for duty with the R.F.C. on May 18th, 1916.

His major in the R.F.C. wrote that he was very skilful, full of daring and gallantry. He was a grandson of Lt.-Col. J. T. Campbell, a Crimean veteran, and his father belonged to a Cadet family of the Macdonells of Glengarry, which have given so many officers to the Empire.

* * *

MORGAN.—Killed while flying on Sept. 21st, Sec. Lt. Vernon Leslie Morgan, of the R.F.C., youngest and dearly loved son of Mr. and Mrs. Ed. Morgan, of East Sheen, and Auber-villiers, France, aged 21.

* * *

OSMASTON.—Killed in action, on Sunday, Sept. 24th, Sec. Lt. Robert Shirley Osmaston, M.C., Royal Sussex Regiment, att'd. Royal Flying Corps, dearly loved youngest son of F. P. Osmaston, Esq., and Mrs. Osmaston, of Stoneshill, Limpsfield, Surrey, aged 21.

PINSENT.—Killed in action, on Sept. 24th, the eve of his 19th birthday, Philip Ryland Pinsent, Sec. Lt. R.F.C., youngest son of Mr. and Mrs. R. A. Pinsent, Selly Wick, Birmingham.

Mr. Pinsent was educated at Horris Hill and Winchester. He obtained a commission in the Royal Flying Corps in April, and went to the front early in July. He was severely wounded in an air fight on Sept. 23rd, and died on Sept. 24th.

* * *

REID.—On July 16th, 1916, from wounds and shock received while flying the previous day, John Laurie Reid, Sec. Lt. Northumberland Fusiliers, and attached to the R.F.C., son of Mr. and Mrs. J. W. Reid, Napier, New Zealand, aged 23.

* * *

SHIVES.—An inquest was held at Thetford on Sept. 30th on Capt. Robert Kilgour Shives, 25, Flt. Comdr., R.F.C., who met his death on the previous day through the bursting of a gun. A verdict of accidental death was returned.

Capt. Shives' home was at Campbellton, New Brunswick, Canada, and he had been wounded while flying in France.

* * *

TOWER.—Hugh Christopher Tower, Capt. R.F.C., officially reported missing, believed killed in air action Sept. 19th, 1916, aged 30, dearly loved and only surviving son of Christopher J. H. Tower and Mrs. Tower, of Wealdside, Brentwood.

Capt. Tower was educated at Sir Anthony Browne's School, Brentwood, and abroad. He passed the Surveyor's Institute examination and was sub-agent on the estates of Lady Heytesbury and the late Sir Edmund Antrobus in Wiltshire. On the outbreak of war he volunteered for Special Reserve, R.F.C., and joined at Farnborough on Aug. 15th, 1914. He was flying in France from April, 1915, until he returned to England on promotion to Flt. Comdr. on Nov. 1st, 1915. After six months' work in England Capt. Tower resumed his duties at the front last May, where his skill and fearless bravery were well known. His elder brother, Lt. Christopher C. Tower, Essex Yeomanry, A.D.C., 12th Div., was killed in action on Oct. 2nd, 1915. Captain Tower was at Sir Anthony Browne's School from 1898 to 1902.

* * *

THUNDER.—On Sept. 24th, 1916, at the Norwich Hospital, from burns, the result of a flying accident, Sec. Lt. Michael Hubert Francis Thunder, R.F.C., youngest son of the late George Thunder, of Lagore, Co. Meath, and Margaret, daughter of the late Augustus Welby Pugin.

Mr. Thunder received his commission in Dec., 1915, and was gazetted flying officer, R.F.C., in March of this year. It appears that he was searching for hostile airships at the time of his death.

He was interred at Ramsgate on September 29th. An escort of forty men of the Royal Flying Corps met the body at the station, and the coffin was placed upon an aeroplane trailer attached to a Flying Corps motor lorry. Six officers acted as bearers. Prior O'Gara officiated at the funeral at St. Augustine's Abbey. A firing party attended.

* * *

Mrs. Cousins thanks all those who have sent her such kind letters and telegrams of sympathy in her great sorrow. She hopes in time to be able to thank each individually.

[Sec. Lt. Guy Cousins, R.F.C., was reported as killed last week.—Ed.]

* * *

Sergt. Frederick Keyle and First-Class Air Mech. Harry Claney, of the R.F.C., were killed on Sept. 28th as the result of an aeroplane accident in South-East Kent.

ENGAGEMENT.

CLEGHORN—BARR.—The engagement is announced of Major Alexander Cleghorn, R.F.C., elder son of Mr. and Mrs. Alexander Cleghorn, 14, Hatfield Drive, Glasgow, and Morag, daughter of Professor and Mrs. Archibald Barr, Westerton-of-Mugdock, Milngavie, Stirlingshire.

MARRIAGES.

KERRIDGE—STARKEY.—On Sept. 27th, at St. Mary's, Wanstead, by the Rev. Canon Corbett, Leonard Roy Kerridge, Sec. Lt., R.F.C., to Grace Starkey, younger daughter of the late Capt. Starkey and Mrs. Starkey.

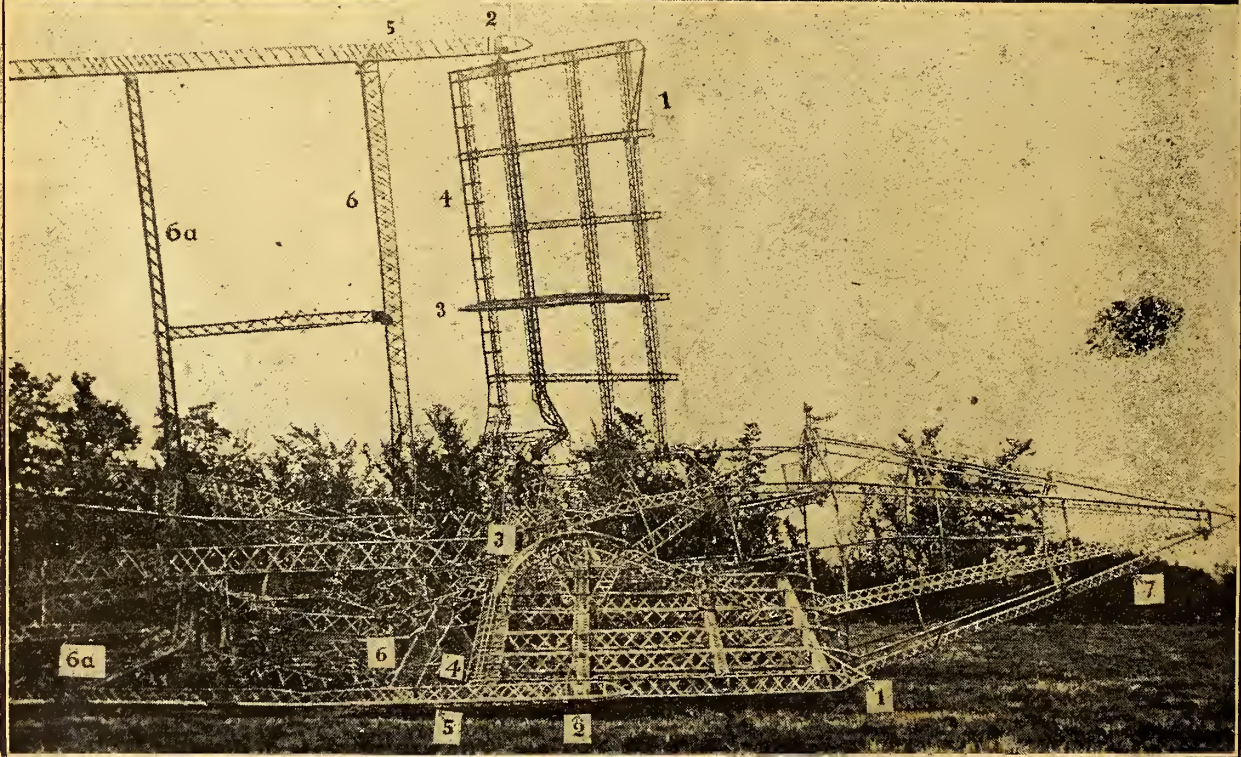
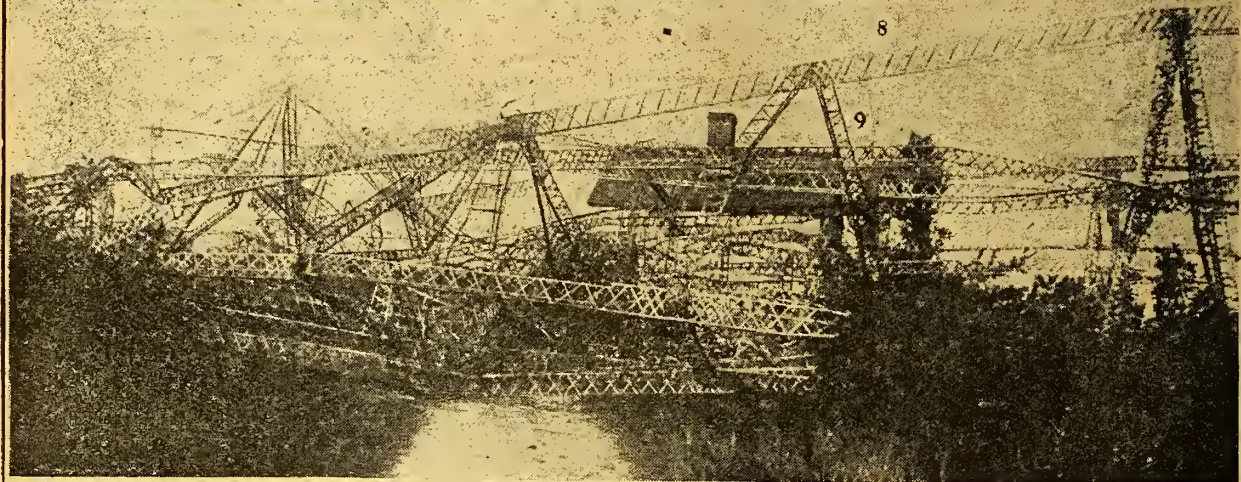
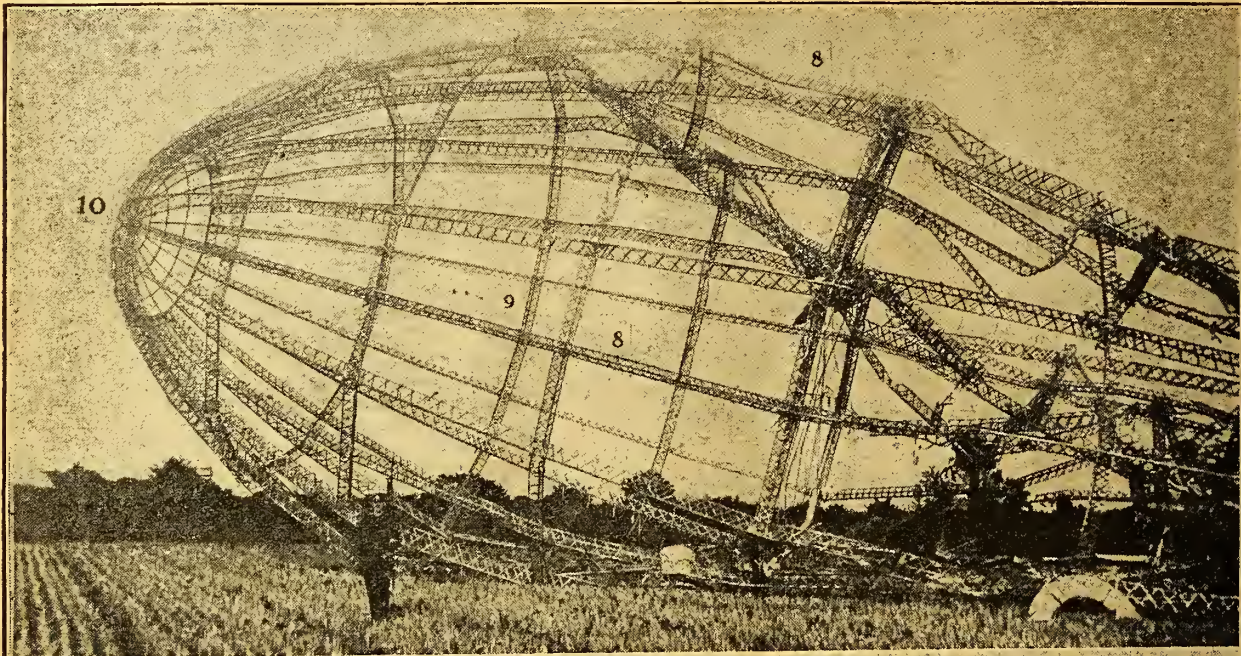
* * *

MOXON—FOWLER.—On Sept. 23rd, 1916, at Christ Church, Radlett, by the Rev. A. P. Du Cane, Paul B. Moxon, Sec. Lt., R.F.C., only son of Mr. and Mrs. Moxon, Broad Ing, Alderley Edge, Cheshire, to Alice E. Fowler, second daughter of Mr. and Mrs. G. W. Fowler, of Radlett, near St. Albans.

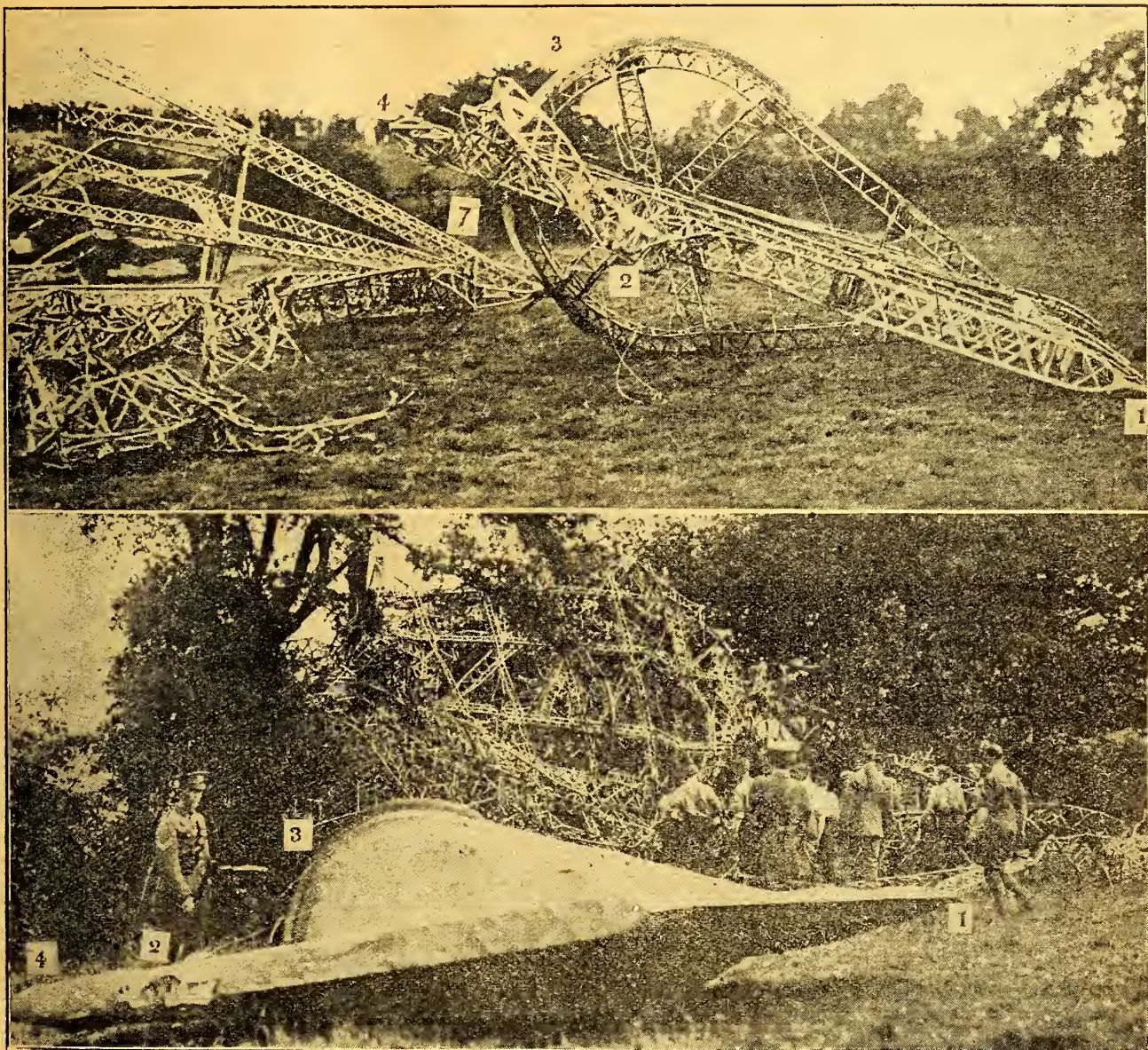
BIRTH.

SPICER.—On Sept. 27th, at 40, Buckingham Mansions, Hampstead, N.W., the wife of Major Malcolm Spicer, R.F.C., of a son (still-born).

SOME DETAILS OF ZEPLIN



ELIN CONSTRUCTION.



SOME DETAILS OF ZEPPELIN CONSTRUCTION:—Above, and on the opposite page, are shown some interesting details of the construction of Zeppelin Airships, as shown by official photographs taken by the Central News Agency of the two ships brought down in Essex on Sept. 24th. Those above are taken from the ship which was set on fire in the air, and the others are from the ship which was burnt by the crew. The top picture shows the nose of the latter ship. The middle picture shows the wrecked centre section as it collapsed across a lane, on being burnt. And the bottom picture shows the tail and elevators. The left-hand elevator appears in side elevation, and the right-hand elevator appears in plan view, having apparently been forced up vertically by falling on to the hedge and bank seen in the background. Thus one gets a convenient plan and elevation of the structure. The pictures above show one elevator complete in perfect side elevation, but with the fabric burnt off, and the other somewhat fore-shortened with the fabric on it, but with the lower half of the control-wire quadrant collapsed. In the upper picture the whole quadrant and its stays appear clearly. The various girders are evidently now of plain "X" type lattice construction, instead of the complicated "W" girders hitherto used. The parts shown are indicated by numbers as follows:—

1.1.1.—Trailing Edge of Elevator.

2.2.2.—End of Axis on which Elevator works.

3.3.3.—Quadrant to act as Lever and Guide for Elevator Control Cables.

4.4.4.—Balanced Leading Edge of Elevator.

5.5.5.—Outside Girder from Fixed Tail continued to form Support for Elevator Axis.

6.6.6.—Trailing Edge of Fixed Tail Plane, or Empennage.

6a.6a.—Cross Girder of Fixed Tail Plane.

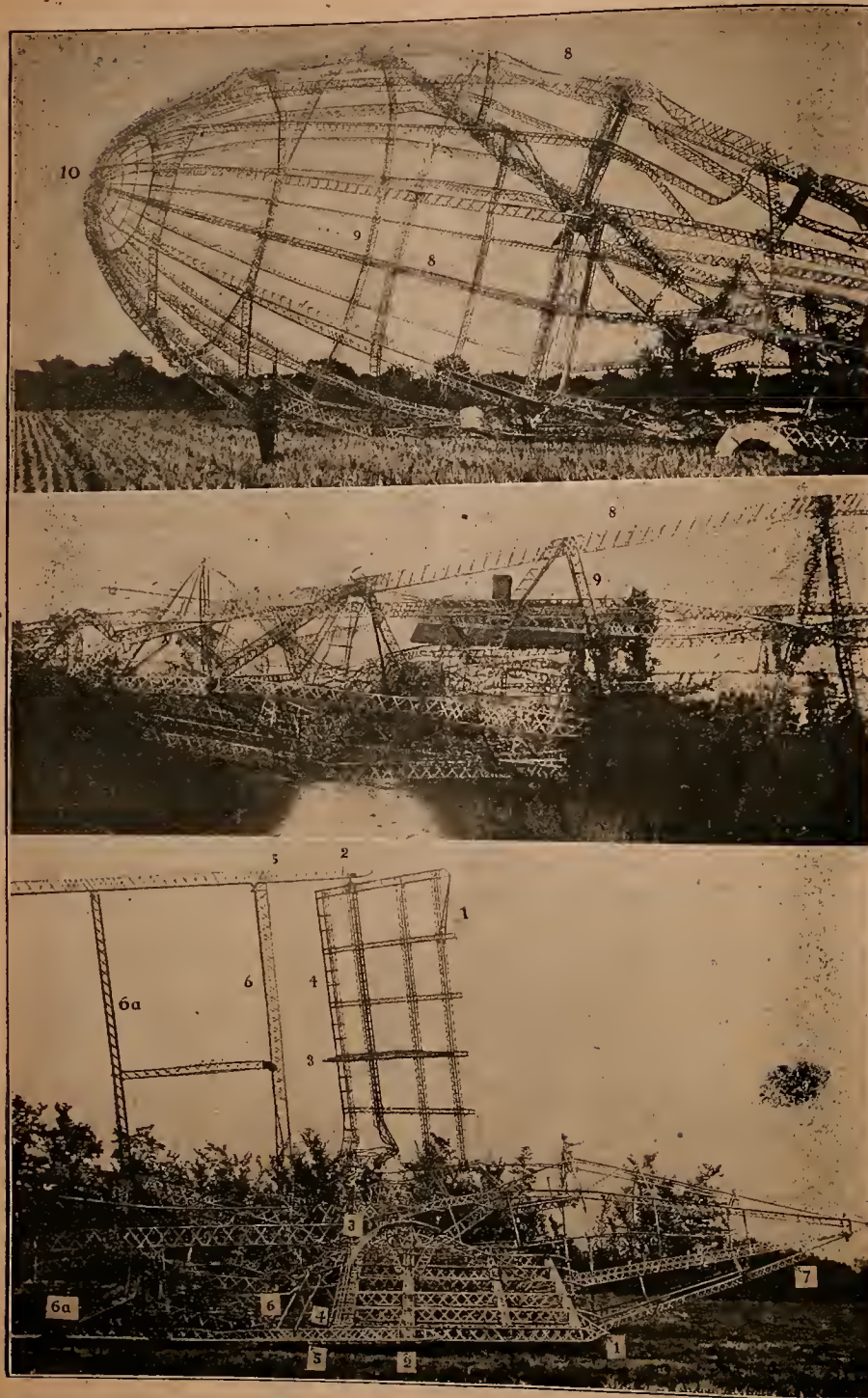
7.7.—Streamlined Stern of Airship.

8.8.—Main Longitudinal Girders.

9.9.—Main Hoop Girders.

10.—Nose of Airship.

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FRANCE.

OFFICIAL COMMUNIQUÉS.

SEPT. 26th.—It appears from fresh information that the Zeppelin which flew over the Calais district during the night of Sept. 22nd and 23rd dropped twenty bombs, all of which fell in waste ground at a great distance from the town.

It is probable that, caught by the fire of our guns, the Zeppelin got rid of its projectiles in order to ascend higher and escape.

Yesterday our *avions de chasse* fought forty-seven engagements on the Somme front. Five enemy machines were brought down, while ~~three~~ more, which were seriously damaged, were obliged to alight. Another machine, which was attacked at close quarters with a machine-gun, fell disabled, but could not be followed to the ground. During these engagements Sous-Lieutenant Heurtaux brought down his 8th machine in the direction of Villers Carboneil, and Adjutant Dorme his 12th machine north of Lieramont.

In the Woevre Adjutant Lenoir attacked an enemy machine constructed to carry three, and after a very hard fight brought it down near Fromezey (north-west of Etain). This is the 11th machine brought down to date by this pilot.

Our bombarding squadrons carried out the following operations: On Sunday night 200 bombs of 120 mm. (5-inch) were dropped on the blast furnaces of Dillingen, on the factories of Sarrelouis, and on the railway station of Metz-Sablons. 22 bombs were dropped on the blast furnaces of Rombach and on the railway line between Metz and Thionville.

During yesterday evening four of our machines, armed with guns, fired 82 shells on the enemy organisations of Sailly-Saillisel and of the Bois de St. Waast.

Yesterday afternoon 30 bombs were dropped on bivouacs in the region of Montfaucon Nantillois, and 12 on the military installations near Ozannes.

Finally, last night our aircraft dropped 102 bombs on the railway station of Noyon, 52 on the aerodrome of Hervilly, and the railway stations of Ham, Fins, and Voyennes. Yesterday afternoon an enemy aeroplane dropped two bombs which fell on the dunes north-east of Calais without any result.

SEPT. 27th.—On the Somme front our aviators yesterday engaged in a number of fights. Sous-Lieut. Nungesser in the course of this day alone brought down two German aeroplanes between Le Transloy (north-east of Lesbœufs) and Rocquigny (east of Le Transloy), and an enemy captive balloon, which fell in flames in the Neuville district. These three victories bring up to 17 the number of machines brought down by this pilot up to yesterday.

Two other German aeroplanes which had been seriously hit fell out of control—one towards Le Transloy and the other near Le Mesnil Brunet (south of Péronne). Another captive balloon attacked by one of our pilots collapsed near Nurlu (north-east of Péronne). In Champagne a Fokker, attacked at close quarters, fell at first in spirals, then vertically, and was smashed, crashing to the ground at Grateuil, north-west of Ville-sur-Tourbe.

Last night (Sept. 26th-27th) a group of 14 of our aeroplanes dropped 110 big-calibre bombs on the railway station, the railway lines, and the hutments at Appilly (east of Noyon). The night before the railway station at Laon got 22 bombs and the bivouacs at Montfaucon 17.

SEPT. 28th.—Army of the Orient.—Our aeroplanes bombarded Kenali, south-east of Monastir.

SEPT. 29th.—In the course of yesterday a Fokker, attacked by one of our pilots, crashed to the ground north of Reims. Another Fokker badly hit nose-dived into its own lines.

Our aeroplanes dropped several bombs on Monastir, where an explosion was observed.

OCT. 1st.—A captive balloon was brought down in flames in the region of Longavesnes, on the Somme front.

Army of the Orient.—One of our aeroplanes bombarded Sofia and continued its course to Bukarest, where it landed.

OCT. 2nd.—It is confirmed that Maréchal de Logis Vialet brought down his fifth German aeroplane in the region of the Somme.

Adjutant Bloch brought down a German captive balloon east of Bapaume. This is the fifth balloon brought down up to now by this pilot.

* * *

The "Echo de Paris" (Sept. 28th) publishes an article on the necessity of the Allies building airships. "This necessity," it says, "becomes more urgent every day. It is the sole means of preventing Zeppelin raids. If each time Zeppelins made a raid a squadron of airships bombarded Hamburg, Bremen, or Cologne, the Boches would soon renounce their trips. The need of dirigibles is urgent also for naval warfare, and it is high time that action were taken."

* * *

The communiqué of Sept. 24th recorded Lt. Guynemer's 17th and 18th victories over German aircraft on the Somme front. As a matter of fact Lt. Guynemer destroyed three aeroplanes on that day while extricating a brother aviator from the clutches of five enemy craft. Two of the latter took flight and three remained.

At 11.22 the first German was shot down. The second followed

30 seconds later, and the third, already in full flight, was destroyed at 11.25.

The "Matin" says that almost immediately afterwards a shell struck the machine. He was 3,000 metres (about 10,000 feet) up when a shell burst full in one of the wings of his aeroplane. The whole left wing was completely cut to bits, and the canvas fluttered in the wind, making the rent still worse. In a few seconds there was nothing left on the frame but a piece of canvas the size of a pocket handkerchief. [Presumably the machine was a Nieuport biplane and it was only the small lower plane which was blown away.—Ed.] Guynemer declares he gave himself up for lost: the only thing he asked Providence for was that he should not fall in enemy territory.

"I was powerless to make my will felt. My machine refused to obey me. At 1,600 metres I determined to make a fight for it all the same. The wind had brought me back into our own lines. I was almost happy. I was already thinking of my funeral, with sorrowing friends walking behind my last remains. I had nothing more to fear from the Pickelhauben. However, I felt that it was death, and the thought is not a very pleasant one.

"My fall continued. In spite of all my efforts I could not do what I wanted with my machine. I tried to turn it first to the right and then to the left. I pushed and pulled, but all to no purpose. I could do nothing. Down I fell, faster and faster, drawn surely and inevitably to the earth, where I was going to be smashed to atoms, a brutal end and a futile one." I shut my eyes. Then I opened them again and looked down. At something like 180 kilometres (112 miles) an hour I crashed into a pylon. There was a terrific cracking sound and a deep thud. I looked round and found that nothing was left of my machine.

How is it I am still alive? I wonder myself. I think it was the straps which held me in my seat which saved my life. They had eaten right into my shoulders anyhow, but if it had not been for them I should be dead at this moment."

* * *

A summing up of the communiqués issued between July 1st and Sept. 25th shows that 250 enemy aeroplanes have been destroyed or brought down out of control within their own lines; 22 observation balloons have been burned; 142 objectives within the territory occupied by the Germans have been hit; and 5,426 bombs have been dropped.

* * *

The following further details of the recent French air raid on Essen were reported from Paris on October 1st:—

The two French aviators, Capt. de Beauchamp and Lieut. Daurcourt, who had been selected to bombard the factories at Essen, were provided with machines which had been carefully overhauled. The start, however, which was to have taken place on Sept. 14th, was postponed until Sept. 24 on account of the rain.

The two aviators left with a few minutes' interval between them, and then soon rejoined each other when they had reached a certain height, and flew in a northerly direction. The time of their departure was 12.15 p.m.

The weather was fine, and the chief features of the country could be read like a map. The aviators followed the Moselle and reached Treves. Leaving Coblenz on their right and avoiding the large towns they crossed the Rhine north of Remagen.

The plan of the journey had provided at this point for a possible change of direction. If their objective, Essen, had seemed impossible to reach they were then to have bombarded the railway station at Cologne. But all went well, and already Essen was becoming visible in the distance.

The aviators flew over the town at 2 o'clock, having travelled 200 miles in one hour and 45 minutes. The machines were then at a height of 13,000 feet. The weather was fine and clear.

The aviators threw their bombs with great precision, for they soon saw bright flames and brief sparks bursting forth. This was followed by a column of smoke, while the aviators circled over the factories without being hit by a single shot.

The return voyage was easily accomplished. The aviators saw near the river the bright town of Liège. The road was clear, and they returned in safety. Before coming to earth Capt. de Beauchamp looped the loop.

GERMANY.

OFFICIAL COMMUNIQUÉS.

SEPT. 26th.—A Russian giant aeroplane near Borguny, west of Krevo, after a hard fight with one of our aviators, was shot down. In the same region a Russian monoplane also succumbed in the course of an air fight.

SEPT. 26th.—This morning the naval air station on Lake Angern (west of the Gulf of Riga) was again unsuccessfully attacked by two Russian seaplanes. Our aeroplanes succeeded in engaging one of the seaplanes above the Lake, and shot it down after a short fight. The second seaplane was damaged by our artillery fire, and escaped in the direction of Runö Island.

SEPT. 27th.—Yesterday and the day before six enemy aeroplanes were brought down in aerial fights on the Somme. Another machine was brought down yesterday in Champagne.

NAVAL.—On the night of Sept. 25th-26th a section of our naval airships lavishly bombarded with explosive and incendiary bombs, with visible good results, the British naval port of Portsmouth,

the "reinforced" places at the mouth of the Thames, and industrial and railway installations of military importance in Central England, including York, Leeds, Lincoln, and Derby.

In spite of strong enemy attacks, our airships returned undamaged.

SEPT. 28th.—Yesterday our aviators shot down seven aeroplanes, four of which were brought down in the Somme sector.

A small enemy air squadron which crossed into and returned over Dutch territory attacked Arlost without success.

During a British bombing attack on Brussels 15 houses were destroyed and 13 Belgians were killed, while 28 were wounded.

Our aviators dropped a large number of bombs on Bukarest, which was still burning at several points as the result of previous attacks.

SEPT. 30th.—BALKANS.—Our air squadrons attacked with success the railway bridge of Cernavoda and the enemy troop camps.

OCT. 1st.—In the battle of Hermannstadt one aeroplane shed and two aeroplanes were captured.

Bukarest was bombarded with good success by our aeroplanes squadrons.

OCT. 2nd.—The military buildings at Calais were attacked by one of our airships.

During the night of Oct. 2nd several naval airships successfully dropped bombs on London and military works on the Humber.

Despite the heavy firing by anti-aircraft guns all the airships returned, except one, which was shot and set on fire by anti-aircraft guns, and fell to earth near London.

* * *

Lieut. Mulzer, a noted German aviator, is reported to have been killed in action. The Emperor had conferred on him many orders, among them that of the Order Pour le Mérite.

It is also reported from Geneva that Herren Muller and Schwartzkopf, two famous pilots, have been killed.

* * *

According to the "Cologne Gazette" (Sept. 28th) Lt. Wintgens, recently reported killed, was accompanied by his friend, Lt. Hohen-dorf, and other aviators, and when flying at an altitude of 12,000 ft. he was suddenly attacked from behind by two British aeroplanes. The latter were protected by the sun behind them, and, in consequence, Lt. Wintgens could not see his assailants. A bullet struck his petrol tank, which caught fire, and he fell to the ground within the German lines wrapped in flames.

* * *

According to the "Kreuzzeitung" (Sept. 29th) Naval Lt. Karl Brodruck, commander of the airship destroyed on Sept. 24th, was the son of Lt.-Gen. Georg Brodruck, of Königsberg, and possessed the Iron Cross of the First and Second Class.

RUSSIA.

OFFICIAL COMMUNIQUÉS.

SEPT. 26th.—An enemy aeroplane of the Ilya Mouromets type appeared over Hitzenberg station and threw 17 two pood (72 lb.) bombs, without causing any damage.

In the region south of Dvinsk one of the enemy aeroplanes, being fired upon by our artillery, turned over and was compelled to land. It was observed that the machine became enveloped in black smoke as it descended towards the enemy's lines.

SEPT. 28th.—On Sept. 26th our seaplanes, under the command of Lieut. Gorkovenko, made a successful raid on the enemy aerodrome on Lake Angern (west of the Gulf of Riga) and dropped bombs on their objective. Our machines were subjected to the fire of the enemy batteries, and were engaged in combat with 20 enemy machines. During this unequal contest Lieut. Arseni Gorkovenko unfortunately perished and his aeroplane was lost.

SEPT. 29th.—Our aviators carried out a raid on the rear of the enemy's cantonments in the Bourguny-Krevo district (about 45 miles south-east of Vilna). The bombs dropped caused explosions and fires in the enemy's depôts at various points. Bombs were also dropped on convoys, a narrow-gauge railway, and on wagons.

In the course of the raid there was an air fight, in which four German machines were brought down. One of our big aircraft, after a fight with two Albatros machines, fell in the enemy's lines. In addition to this we lost a machine of the Morane-Parasol type.

OCT. 1st.—In the region south of the town of Riga, our artillery shot down a German aeroplane, which fell in the enemy's lines.

In the region south of Brzezany, on the river Tseniuvka, an air fight took place between a German Albatros and our valiant aviator Capt. Schifkoff. The latter attacked the enemy machine and forced it to descend in the German lines.

* * *

[Some excitement was aroused in the evening papers on Sept. 29th by a statement, alleged to be official, that the Russians were employing "self fliers" for raiding purposes.

It conjured visions of automatic flying machines controlled by invisible agencies sallying forth to wreck their destructive vengeance alone and unaided.

The rumour was due to a simple mistranslation of a Russian word. In Russian the word airship or aeroplane rendered literally into English reads "self fliers."—Ed.]

ITALY.

OFFICIAL COMMUNIQUÉS.

SEPT. 26th.—Hostile aeroplanes dropped bombs on Grigno and Cisono (Brenta Valley); one man was killed and a few wounded.

SEPT. 27th.—Last night one of our airships, in spite of adverse weather, succeeded in reaching the Carso, dropping bombs on a column of enemy troops and convoys on the road from Comignano to Castagnevizza. Although discovered by the enemy's searchlights and fired on by artillery, the airship returned safely.

ROME, Sept. 23rd (Semi-official).—Yesterday evening at sunset a squadron of seaplanes and aeroplanes effectively bombarded the batteries and entrenchments of the look-out station on Salvore Point, returning safely afterwards.

A feature of the anti-aircraft defence of Trieste appears to be the guns on rafts, which can be hidden away behind anything innocent-looking when desirable.

Great efforts are being made by the Ministry of Fine Arts to get the safety of St. Mark's at Venice ensured. One insuperable obstacle is to be found in the reflecting mirror surface of the dead-water canals.

All hope of any future "peaceful penetration" must have died out among the Central Peoples if the narrow escapes which the great church has had were not merely due to bad shots at, say, the Arsenal. Wolff makes the Italian papers announce the destruction of M.4 in the recent attack on Iesi, but diligent search fails to find out which ones. So perhaps he has bought up some parish magazines.—T. S. H.

* * *

It was announced in Rome on Sept. 23rd that the valuable property of the Austrian Imperial family owned in Italy is to be sold, and that the proceeds of the sale are to be devoted to the payment of compensation to sufferers in towns bombarded by Austrian aircraft. It is estimated that the property is worth from fifty to a hundred million lire (£2,000,000 to £4,000,000).

ROUMANIA.

OFFICIAL COMMUNIQUÉS.

SEPT. 26th.—An air squadron yesterday afternoon dropped bombs on Bukarest. No military damage was done, but the bombs fell on a sanatorium and an orphanage, killing 60 of the inmates and injuring many others. More than two-thirds of the victims were women and children.

During the night of the 25th a Zeppelin dropped bombs on Bukarest, killing five children.

Our aircraft dropped bombs on camps in Transylvania.

SEPT. 27th.—Hostile aeroplanes yesterday dropped bombs on Bukarest and the neighbouring villages, causing some loss of life, especially among women and children.

During last night a Zeppelin dropped incendiary bombs on Bukarest, causing two small fires, which were quickly extinguished. One woman was killed and another injured. The Zeppelin was driven off by our artillery.

Near Toplitza our guns brought down an enemy aeroplane.

SEPT. 29th.—Hostile aeroplanes dropped bombs on Tchernavoda, Alexandria (north of Simnizta) and the villages south of Bukarest.

An enemy aeroplane was brought down near Padosu, in the Mehedinzi Department (Turnu Severin).

An enemy aeroplane arrived at Bailesti (east of Vidin), from the direction of Salonika.

OCT. 1st.—In attacks by enemy aeroplanes bombs were dropped on Bukarest, where two women and six children were killed; on Cernavoda, and on Budesti.

BULGARIA.

OFFICIAL COMMUNIQUÉ.

SEPT. 28th.—Along the Danube the situation is calm. At Orechovo we shot down an enemy aeroplane, which fell on the left bank of the Danube.

* * *

A telegram from Sofia to the "Kölnische Zeitung" (Sept. 30th) states that early on Sept. 27th an enemy aviator coming from the south at a great height dropped five small bombs on Sofia, killing a scavenger and two horses, and slightly wounding a woman and two children. The material damage consisted of some broken windows. Pursued by Bulgarian aeroplanes, the enemy escaped.

THE AIRSHIP EXHIBITION.

On Tuesday, Oct. 3rd, a private view was held of additional airship relics placed on show in the grounds of the Honourable Artillery Company in City Road, under the auspices of Sir Charles Wakefield.

Most of the earlier relics were still on view, but in an additional marquee portions of L32 and L33, brought down on Sept. 24th, were exhibited. The show consisted of some damaged Maybach engines, some more or less complete gondolas (very damaged), gas valves, propellers, and gears, bomb catches and portions of the steering gear. Two prominent portions of the frame shown were the stream-line tail-piece of one airship and one of the huge elevator flaps.

The show will be open to the general public for another week at least.—W. L. W.

THE INVASIONS OF ENGLAND.

Somewhat to the surprise of most people an air raid took place on the night of Sept. 25th-26th, a matter of only 48 hours after the raid on the previous Sunday morning which ended so disastrously from the German point of view.

It might have been expected that the enemy would have paused to consider the position in view of the loss of the two airships, but undoubtedly those in authority thought it necessary that another raid on a large scale should be made for psychological reasons at home. The raid, which was carried out by seven airships, seems to have covered a particularly large area and the casualties are rather severe.

Bombs were dropped in certain industrial areas in the Midlands, and though the damage was confined to private property, it is said that 36 people were killed in one town.

The South Coast was visited, as is indicated in the official communiqué, and the Brighton Municipal authorities have issued the curious request that a rumour to the effect that airships were over Brighton and Shoreham during this raid is incorrect. They say there is not the slightest foundation for any such statement. It is not quite clear whether this denial is an implication that the towns of Shoreham and Brighton are impregnable, or whether it simply indicates that they are merely inherently lucky. If this is the case one wishes every success to their immunity in the future.

Nevertheless, airships visited a certain South Coast town which was full of visitors, many of whom had come from districts where raids are frequent, attracted by the reputed safety of the place. The streets were quickly cleared by special constables, etc., but fortunately no bombs were dropped. It is said that an airship which passed over this town appeared to be suffering from engine trouble, but it apparently got successfully out to sea.

The Huns seem peculiarly unfortunate in adding to their reputation for kirk-strafting, and on this occasion they succeeded in blowing a Wesleyan Chapel inside out. It is a curious fact that some place of devotion or another seems to come in for it almost every time. Of course, the chief reason for this phenomenon is the large number of such institutions, and their comparatively large size. There seems to be no distinction as regards the sects which come in for these visits, as the damaged buildings have included every kind of place of worship from High Churches downwards, and during one of the earlier raids on the London district an Ethical Chapel was nearly if not quite hit.

In certain places a good many houses are reported damaged by shrapnel, and it is said that in one small area 200 houses suffered in this way. It is not absolutely clear whether all this shrapnel came from bombs or from anti-aircraft shell, but in either case it points to the wisdom of keeping indoors when nothing stronger than curiosity tempts one out.

* * *

On Sept. 27th the crew of the Zeppelin wrecked on Sept. 24th were buried in the old churchyard of the parish in which they met their fate. The funeral was carried out by the R.F.C.

Only one coffin bore a name plate, which read:—

Commander Brodruck.

Killed on service, Sept. 24, 1916.

The 21 coffins of the crew were placed in a large R.F.C. motor-lorry, and covered with a black pall. The coffin of the commander was carried on the trailer of a second lorry. Following the lorries was a motor car, in which were six officers of the R.F.C. A party of men of the Corps marched behind.

The churchyard lies about a mile from the barn which served as a mortuary. The officers of the Flying Corps carried the coffin of the German commander on their shoulders into the churchyard. Each of the coffins of the crew was borne by four of the men. In a corner of the churchyard two graves were made—one, a wide and deep pit, for the crew, and the other, beside it, for the commander.

During the funeral service, which was conducted by an Army chaplain, assisted by the vicar of the parish, the officers of the Flying Corps surrounded the grave of the commander, and the men were drawn up at the foot of the grave of the crew. The only other persons present in the graveyard were the local members of the special constabulary. After the service the "Last Post" was sounded by two buglers.

The parishioners intend to put up in the church a tablet cast from some of the metal remains of the Zeppelin, recording the fall of the airship in the parish, with an expression of thanksgiving for the deliverance of its inhabitants from harm during the raid.

* * *

According to the "Times," wire taken from the airship which was brought down at Cuffley is being made into souvenirs to be sold on "Our Day," October 10th. Some of the wire is being fashioned into finger-rings. One shilling will buy a wire brooch; for sixpence you will be able to get a piece of the wire in an envelope with the Red Cross guarantee that it is "real Zeppelin."

[How clever of the Red Cross Society!—Ed.]

Two inquiries arising out of the London air raid of Sept. 23rd-24th were held on Sept. 26th by the Coroner of a suburban district.

The Coroner said that from the strictly legal point of view he was not so sure that a verdict of wilful murder could not be returned against the crew captured from one of the Zeppelins brought down during this raid, for they were all part and parcel of the same mission to this country with murderous intentions. Yet the aim of the enemy might be said to be a military one. So he (the Coroner) thought it would be better, perhaps, to waive opinion on such points and return a verdict that death was due to fragments of a bomb thrown from an enemy aircraft. The jury fully concurred.

[Which seems sensible of them.—Ed.]

* * *

Harvesters working near an Essex village on Sept. 28th found a large-sized machine gun, the barrel of which had been damaged, and close by an automatic pistol capable of holding eight cartridges.

It is believed that both these weapons had been discarded by the crew of the Zeppelin which was brought down two miles away.

The machine-gun, which is said by one newspaper to weigh about half a ton (which it could not), had been rendered unfit for use before being jettisoned, and there were marks upon it suggesting that it had suffered by gunfire during the attack upon the Zeppelin.

* * *

On Sept. 28th inquests were held in two Northern towns upon the bodies of 41 persons who were killed during the last raid. Numerous inquests had been held in other parts of the country.

* * *

The following letter to the "Times" is full of excellent common sense:—

Sir,—The air raid policy of Germany serves to point a moral which should never be forgotten. If a Government persistently lies and encourages lying to the people, conditions arise with which it may be impossible to cope. The Germans, whose eagerness to believe that what their hatred demands is happening has become a form of madness, have been told that the Zeppelin raids have destroyed munition factories and strongly fortified places, crippling British action, and striking terror to the heart of the nation. Their rulers are perfectly well aware of the military futility of the policy of indiscriminate murder; but they are faced with a dilemma of their own creation. If they stop the raids, the deceived masses will either lose heart or convict them of calculated mendacity. If they continue their policy, they must expect and they will incur heavy and useless losses. The latest raids were not unconnected with the latest war loan.

I am, Sir, yours obediently,

September 26th.

* * *

MILES.

The photographs officially issued of the wrecked airships brought down on the morning of Sept. 24th reveal them to be of very modern construction, and the numbers and appearance of the vessels make it clear that they were sister ships. It is said that one bore the date June, 1916.

The airships had a direct-driven propeller at the rear of the stern gondola, and special protection in the form of elaborate windshields was provided for the crews in the gondolas. The general lay-out of the airships does not seem unusual, with the exception that the keel underneath the gas-chambers has apparently been reduced considerably in size.

* * *

A daily newspaper points out the frequent invasions of England by hostile airships has benefited at least one class of trade, to wit, the makers of dressing-gowns. It is said that in these times when one may suddenly be awakened in the "wee sma' hours" and hurried into the street, a dressing-gown is a necessity.

The manager of one of the largest London shops stated that they were selling nearly twice as many dressing-gowns, both ladies and gentlemen's, and that the former are, moreover, in many cases "real creations" which would pass muster before the high priests of fashion.

Incidentally there is a beautiful story told of a young gentleman, well known in aviation circles, who during the excitement of a recent Zeppelin raid near the London area found it necessary to escort half-a-dozen terrified damsels in the Mayfair district to a local cabman's shelter while attired in pale blue silk pyjamas, a purple silk dressing gown with green collar and cuffs, green shoes and socks, a "topper" and a clouded cane; the ladies being still more exiguous as regards their attire.

The cabmen welcomed the party, but one gathers that a very young and very modest policeman, who had apparently only lately "taken orders," was unduly shocked by the exhibition, and evinced a keen desire to arrest the whole outfit. However, two of his more experienced comrades pointed out that there were extenuating circumstances, and they finally all joined in the festive cheer of the kind approved by the taxi-Jehu.

To Aircraft Constructors and all Interested in the Aircraft Trade

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Or to Head Office:

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Telephone: Central 2263.

Telegrams : "Tetrafree, Newcastle-upon-Tyne"

A NIGHT OUT.

According to an old-established proverb a policeman's life is not a happy one, and the saying is a truism of the "Special" variety of constable, as well as of the pukka breed. Nevertheless, every cloud has a silver lining, and both the amateur and professional "Roberts" find morsels of consolation here and there.

The writer of these notes did not feel particularly pleased with the course of the war when on arriving home in Central London at 10.30 p.m. on Sunday, Oct. 1st, after a delightful evening with Tchailovsky and E—, he found a peremptory notice awaiting him to report forthwith at the local police station. A mobilisation always conjures up to the mind of the unfortunate Special visions of a night of loafing about at a police station, or elsewhere, encouraged only by a certain amount of latitude in the licensing regulations.

After a period of sauntering around the streets on a motor-cycle side-car combination with a sergeant, inspecting comrades who are attending to the physical well-being of fire-alarms, the writer paused to chat with a man at the corner of a road looking North.

Searchlights had been inquiring into the secrets of the upper atmosphere without apparent success, and had for the moment gone back into their shells, when suddenly a spot of light appeared in the North, which rapidly developed into a horizontal streak. This transmuted itself into a flame, and the front end of the streak tilted down until it became quite vertical, and in perfect silence steadily travelled down to the ground with exactly the appearance of a flaring torch. The utter silence and suddenness with which the conflagration appeared was really most impressive, but the usual football roar rolled up from the whole of Central London immediately afterwards.

Thereupon, the professional interest of the journalist overcame the patriotic enthusiasm of the Special, and he forthwith hied to the police station and persuaded the officer in charge to dispense with his services for the rest of the night.

Every motorist knows the road to Potters Bar where the ship fell, and it was only necessary to sit tight and open the throttle wide and blind along through the deserted streets, praying all the time that a Northward-bound traveller would not forget to keep his rearlight trimmed on whatever vehicle he might choose to hide him thitherward.

Nothing of interest was passed until the outer suburbs were reached, and then actual interest was aroused by the apparition of a—searchlight mounted on a—, but on reaching the fifth milestone from the scene of the smash things became unpleasantly exciting by reason of the endless stream of cars that were being driven by owners, apparently in the worst of tempers, in a Southerly direction. They careered about all over the road, and occasionally it was necessary to drive up on to the near side of the pavement to avoid a collision! The occupation of these hurried charioteers was not immediately apparent, but on reaching the outskirts of Potters Bar it became more or less clear what the trouble was. There was a cordon of police drawn right across the road who were occupying themselves by making every unauthorised person who had driven out of town to see the fun turn his car round and go home! As the journalistic-cum-special constabulary three-wheeler came within the glare of a portable searchlight carried by a hefty policeman, the uniform which the writer had forgotten to take off moved them to let him pass in peace, and after deserting his machine by the roadside he passed yet another cordon of police at the entrance to a lane which led to the field where the Huns had found trouble.

Of course, it was still absolutely pitch dark, and one continually fell over recumbent soldiers who were trying to snatch a few minutes' sleep on the sodden ground while awaiting orders. In the middle of a field were a crowd of soldiers who had been rushed up to the scene of operations from a building known to most Londoners and every countryman, namely, —! They were quite happy, because they really thought they had something to grouse about, as apparently most of them had already been on duty elsewhere for more hours than it might be wise to mention, and they formed one big ring and one little ring, in the centre of which it was just possible to discern two heaps of corresponding sizes.

There then remained nothing else to do but to squelch round in circles in inadequate foot attire until such time as the daylight chose to come. A good deal of vituperation was aroused by the pushing back of the clock, as everyone seemed to think that because of the operation of this very useful Act of Parliament the onlookers were let in for an additional hour's wait! Nobody seemed to realise that the Germans have no use for our Daylight Saving Act, and suit themselves entirely as to what time o' day they arrive (in England) and depart (this life).

A number of hours passed which seemed like 20 or 30, and then one began to realise that it was possible to see rather more detail in the heaps than before, and then in a surprisingly short time it became possible to distinguish everything that was distinguishable—which was not a lot.

The main bulk of the airship had fallen head-first to the ground, and had come down on top of a large and venerable tree. Most of it had gone straight through the tree and had telescoped into

the ground, while a few of the lighter parts hung around aloft in festoons. The whole structure of the airship had so telescoped itself that it was impossible to distinguish anything at all in the heap of girder work except one or two bits of rib aluminium sheeting which suggested portions of a gondola.

The smaller heap, however, was a great deal more interesting, as this consisted of a complete gondola, apparently the stern unit, which had come down of its own accord 100 yards from the rest of the ship, complete with engines, side bevel-driven propellers, stern propeller and screw.

The airship, as a whole, was so badly smashed that it was absolutely impossible to decide whether there were any notable modifications in her design over earlier patterns. Her number is said to be L31, her date June 17th, 1916. One interesting point, however, was the extensive use of cross-trellis work in the girders, as distinct from the earlier girders which were built up of cross-members in the form of W's. All the propellers that could be recognised were two-bladed.

The homeward journey, aided by daylight, was even more immoral, as regards speed, than the outward trip, and a hot bath and two hours' sleep had to be a sufficient tonic for the next day's work, but, taking everything all round, it was worth it.—W. L. W.

THE FLYING SERVICES FUND.

Readers who are of benevolent mind, or who have made vast War Profits and desire to disburse a modicum for pious purposes, are reminded that The Flying Services Fund, organised and administered by the Royal Aero Club, is still in existence and can do with further contributions.

Let there should be any mistake it is well to point out that there are actually three funds pertaining to the Flying Services. There is the Royal Naval Air Service Comforts Fund, organised by Mrs. Sueter, to provide extra comforts for the men of the R.N.A.S. There is the Royal Flying Corps Aid Committee, the head of which is Lady Henderson, which does similar work for the men of the R.F.C. And there is the Flying Services Fund, which exists for the purpose of assisting officers and men, and the dependants of officers and men, of both the Flying Services who may be in need of financial help, either owing to death, injuries or sickness.

The last-named fund is naturally on a somewhat considerable scale, and its subscriptions amount already to over £10,000. The title of the fund was chosen by the Committee of the Royal Aero Club as covering both Services, and it is therefore erroneous to call it the Air Services Fund, as has been done on occasion, for such a title would imply that it is concerned with Naval aviation only, seeing that the official title of the officer commanding the R.N.A.S., is Director of Air Services.

It is just as well, even for those who are not closely in touch with the Flying Services, to endeavour to be as accurate as possible in Service matters, otherwise they are liable to confuse others to whom they profess to impart information.

FOR THE MEN OF THE R.N.A.S.

The Royal Naval Air Service Comforts Fund continues to do its good work under the management of Mrs. Sueter. Since the last paragraph referring to the Fund a further cheque for £20 has been received from the Sunbeam Motor Car Co., Ltd.

The accounts of the Fund have been audited, and a statement has been prepared showing precisely the number of garments and other articles sent by the Fund since its inception.

Steps are being taken to register the Fund under the new Act regulating the collection of money for War Funds, and as soon as the registration has been completed, an appeal will be made for further contributions towards the Fund to those who appreciate the good work done by the men of the Royal Naval Air Service.

LE JEU DE BOXE.

Apparently there was an error in the notes which appeared under the above heading last week. A misprint gave the name of 2nd A.M. Dallaway as Galaway, so followers of the noble art of self-defence in the Midlands may not recognise a name which is probably familiar in the Smethwick district and farther afield.

Also an error in transcribing rough notes omitted the fact that A.M. Harris was knocked out in the first round.

Dallaway has fought seven fights since he joined the Army, and has won them all, so he ought to be able to put up a good show for the Bantam Weight Championship, if and when it is arranged.

Incidentally a pseudonymous writer signing himself "Welshman," and apparently concerned with the R.A.F., writes protesting against the jesting suggestion that pocket-picking is the national sport of Wales, as boxing is the sport of England. He quotes the names of a number of prominent and successful Welshmen in refutation of the suggestion, apparently in an innocent belief that honesty brings success, and in happy ignorance of the ancient and proven theory that if one wants a job well done one should employ a rogue to do it and make it worth his while. One would really expect more knowledge from a person who lives so near the R.A.F., though one need never expect a sense of humour in a Welshman.

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THE AERONAUTICAL INSTITUTE.

The following letter has been sent for publication:—

Sir,—With reference to your leading article in your current issue I must ask you to be good enough to publish the following:—

(1) I receive no payment whatsoever from the Institute either as Secretary, or Director, or in any other capacity. In fact I undertake the Institute's work at a great financial loss to myself. If I do so, it is because I know that the work is a patriotic necessity.

(2) No letter, or document whatsoever, under my signature, has any implied meaning other than the words, actually and straightforwardly, convey.

(3) The Institute is always open from 11 a.m. to 1 p.m. to accredited members of the public who may require information on its aims, policy and work, or membership.

(4) Being actively engaged on *confidential and recognised* war work we regret that we cannot enter upon a Press controversy.

(5) As far as the political situation will allow, the Year Book of the Institute, shortly to be issued, will contain full particulars of the Institute's activities during the year, as well as reports of the work done at its Westminster Workshop and Laboratory.

Yours faithfully,

(Signed) L. BLIN DESBLEDS.

Hon. Director and Hon. Secretary.

[A production worthy of this pretentious concern.—Ed.]

A WAKEFIELD MOVE.

It is announced that Mr. D. W. Thorburn, formerly advertisement representative of this paper, has been appointed assistant to Mr. Frank Fisher, the popular manager of the Motor and Aviation Department of C. C. Wakefield and Co.

Mr. Fisher's immense personal popularity with everyone in the motor and aircraft industry has undoubtedly aided very greatly in securing the vast amount of trade now done in Castrol, though the merits of Castrol itself would certainly assure the firm of a goodly share of business. Consequently, one is not surprised to find that Mr. Fisher needs assistance in dealing with the volume of work now being done.

Over the initials D. W. T. much amusing writing by Mr. Thorburn has appeared in these columns, and one regrets that his connection with the Trade necessitates severance from the Press, as we have scriptural warrant for the statement that no man can serve two masters, and it is, of course, impossible for a Trade paper to have any connection with any Trade firm.

A LIGHTING WARNING.

The Commissioner of Police of the Metropolis issued the following notice on Sept. 28th:—

On Sunday next, Oct. 1st, a further change will take place in the hour at which the provisions of the Order in regard to lighting in London come into operation. Restricted lighting will then commence at six p.m. (Greenwich time), and continue at that hour until the 15th of the month.

THE GERMAN VIEW.

It is reported that the military critic of the "Frankfurter Zeitung" (Oct. 1st) says: "From a purely military standpoint it can be stated that the conditions for our airships to-day—in attacks on England—are much more difficult than they were two years or a year ago. The enemy has had time to bring his defence measures to the greatest perfection." The writer nevertheless believed that the English are panic-stricken as the result of the effects of Germany's air armament.

LIGHTING PLANT.

C. A. Vandervell & Co., Ltd., world-famed for their electric-lighting systems and other plant of a similar nature, have issued an abridged catalogue cancelling all previous lists. This list is in place of the "Blue Book of Car Lighting," which has been their standard catalogue of previous years.

The abridged catalogue contains a number of lighting devices which could very well be used for illuminating instrument-boards and maps on aeroplanes, and, if for this reason only, the list should be in the hands of all those who use aeroplanes at night-time, and of course as practically everyone concerned with aviation uses an automobile of one kind or another, the interest in car lighting is universal.

Applications for a copy of the catalogue should be addressed to C. A. Vandervell & Co., Ltd., Warple Way, Acton Vale, W.—W. L. W.

THE "B.P." MAGAZINE.

The second edition of the B.P. Works Magazine, the organ of Boulton & Paul, Ltd., of Norwich, dated August, 1916, is even more successful than its predecessor. The issue contains an excellent picture of Mr. Henry Fiske, the Managing Director, taken in riding attire, continuations of articles respectively on the Development of Artificial Flight and the Early History of Boulton & Paul, Ltd., cartoons by Messrs. Alan Hill Reid and W. B. Armes, and various other interesting features.

This magazine is certainly one of the most live organs of its class that is being produced at the present time.—W. L. W.

ON MUNITION WORKING—AND SHIRKING.

On Sept. 27th the Farnborough Tribunal heard the adjourned application for exemption from E. P. Elsey, a skilled labourer, of the Royal Aircraft Factory. At the first hearing the applicant alleged that he was being victimised, and that he was being discharged from the factory, although a married man, while numerous single young men were retained.

The Chairman asked the applicant if he still adhered to the statements he made at the last hearing.

The applicant said that at the time they were true, but since then there had been a great "clear out." Pressed for a direct answer, he said he did adhere to his statements.

The Chairman thereupon read extracts from a letter written by Mr. Heckstall-Smith, Assistant Superintendent R.A.F., in which it was also stated that there were no more than 40 men liable to service working in the factory, and they were being sent up as fast as their places could be filled. With this letter was enclosed another, written and signed by Elsey himself, in which he withdrew all the statements made by him and apologised for having made them.

In reply to the Chairman, Elsey said he admitted that his previous statements were not true. He was not discharged from the factory, but was still working there. His foreman, however, had told applicant that he would get him dismissed. "There are," Elsey added, "chaps down there who have not been in the trade before, and only came there in order to keep out of the Army."

In dismissing the application the Chairman said that the applicant's attitude had been most despicable.

[It would be interesting to know whether Mr. Heckstall-Smith's statement is a categorical assertion that there are no more than 40 physically fit men of Military age in the Factory. His statement that there were not more than 40 men "liable to service," as reported in the "Times," is distinctly ambiguous.—Ed.]

FOR PRISONERS OF WAR.

The following amounts have been received during the week ending September 27th for Muriel Countess Helmsley's and Mrs. Rowton's Fund for Prisoners of War in Germany:—From the employees of Vickers, Ltd., Weybridge Works, £6 10s.; from the employees of Vickers, Ltd., Bexley Heath Works, £3 6s. 6d.

A CHANGE OF ADDRESS.

The Lodge Sparking Plug Co., Ltd., wish it to be known that as from September 23rd, 1916, their Registered Offices have been removed from Birmingham to their new factory at St. Peter's Road, Rugby, and that all communications should be addressed to the Lodge Sparking Plug Co., Ltd., Rugby.

NOTA BENE.

Messrs. Parnell and Sons, of Bristol, point out that considerable delay is occasioned by customers and others addressing correspondence inaccurately. The address of their head office is at Mivart Street, Eastville, Bristol, and all letters, advices, invoices and goods should be sent there, and not elsewhere. An additional telephone line has been installed, the number of which is 3857, the old number being 5157. Of course, this line is also in operation, so that no difficulty should be experienced in ringing up the firm.

FLYING AT HENDON.

The week end was devoted to the Hendon munition workers' four days' recuperative holiday, with the consequence that the schools had to be shut down and there was very little flying.

On Saturday afternoon, however, the Grahame-White pilots did a certain amount of flying and some Naval machines were abroad and an aeroplane of large size, whose name may not be mentioned, made a long flight in the clouds at a considerable elevation.

The aerodrome is now enlivened by a number of officers on probation to R.F.C. and also R.F.C. cadets, who wear the Regulation R.F.C. soft caps, but with a white band round them, apparently to be the equivalent of the band worn by line regiment cadets, the effect in conjunction with the fore and aft cap being rather that of a head-ache signal than a military badge.

SCHOOL REPORTS.

HENDON.

AT THE GRAHAME-WHITE SCHOOL.

Instructors: Messrs. Manton, Winter, Pashley, Biard, and Hale. Pupils with Instructor: (Straights): Messrs. Morris and Culver. Circuits: Messrs. Lord, Kaizer, Rogers, Ranson, Steeves, Whiteman, Green, Woods, Robertson, Travers, Sutherland, Cockell, Edwards, Sanders, Styles, Fisher, and Zambournis. Certificate was taken by Mr. Bathurst.

BOURNEMOUTH.

AT THE BOURNEMOUTH SCHOOL.

Instructors: Messrs. S. Summerfield, E. Brynildsen, H. Smith. Pupils rolling alone: Messrs. Ross and Allen. Straights alone: Mr. Barry. Half-circuits alone: Messrs. Davies and Holland. Figures of eights and circuits alone: Mr. Montgomery. Machines in use: 35-, 45-, 60-h.p. Caudron tractor biplanes.

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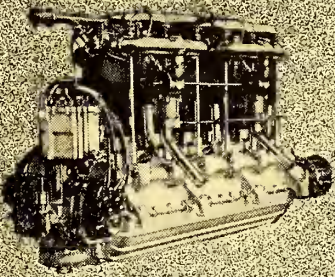
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AERO ENGINE

THOSE ZEPP. MOTORS.

Being the Story of a Piltown Reconstruction.

An actor is a rogue and vagabond—until he joins the R.F.C.—though it is true that the majority of the British stage have been most wrongfully accused. A newspaper man, on the other hand, is a stark outlaw. That is to say, he is wholly outside the control of the Law in its bluest and biggest expression. If he really knows his business he can get in anywhere and see anything close to. Like little Kim, he just looks once and remembers, so never flourishes camera or notebook in the fashion of the stage-reporter, who is very properly abolished dreadfully, early in the second act. He has got to be a rather super-S.S. sleuth, betrayed by no sort of disguise; to look just as any of the idle poor, or an R.A.F. superintendent, might look. And such spies, like any others, are outlaws anyway.

Which accounts, when you come to think of it, for the success, decorations, Gotha visiting-list, and literary style of a certain popular novelist. But for the velvet collar of his dinner-jacket he would be immune from discovery.

A close study of his methods for years, so that I might avoid them, combined with a determination to insist on never seeing anyone less than G.O.Cs., admirals, ministers as fitted,—F.O. a speciality,—head serangs, and main-guys generally; further added to the habit of never looking for anything particular, or in an unlikely place—your amateur always will expect to find tomatoes in a bootmaker's shop—have enabled me to see everything I wished that I had no business to see, ever since I was about twelve years old, and began to frequent training-stables and cajole racehorses variously from sloth and dishonesty.

In the same way, I have managed to surround quite a number of abstruse and secret mechanisms—little things like motors, machine-guns, rifle-actions, barbette-interiors, aeroplanes, and so forth—during an indefinite number of years. Those remote yet accessible souls who possess these things officially and all by themselves, are only too thankful to show them to you if you accredit yourself properly, and seem merely very sympathetic, but not too intelligent.

How? What? Did you ever stand an anchor-watch? Or were you ever for guard on a fine polo afternoon? Or did you never see an only, lonely child with a new toy? That's why.

Consequently, just now I really ought to be—did they but know it at the Metropole or Adastrally!—one of the most valuable subjects in the kingdom, whereas my body is despised of men, R.A.M.C.; or I ought to be interned. But then I can be trusted to write about these little *choses vues* as seldom as may be, at scale rates. Mostly, not at all, unless compelled, persuaded, adjured, and—if the editorial agony can be so far prolonged—paid beforehand.

Anybody can write a story. The thing is to get a real one. Having worked for the "D—y M—l," my standard of real news is a trifle exalted. The noble thing is to get paid for it; the nobler still, to keep that hid. Also, I hate writing, and positively loathe perfect machinery, like harvesters, reapers-and-binders, looms, power-station-plant and such-like. It is only the bad and human, with its mute appeal for improvement, that I can abide. That is why I motor-scribe hopefully, or at all. There is only the somewhat absorbing necessity of making a living, between professional consultations and attempts to swing man-size projects and lang awa' ships, that compels me to write at all except with a rubber stamp.

So, operated by all these causes generally, I happened to be somewhere in France just before the war, ostensibly to see a certain motor road-race. Or anything else that might be seen by any chance. One usually makes chances, and possibly a story or two therewith; mostly by sheer accident and never going to bed. So one is bound to be up early. One of those mornings after, therefore, I happened to be out for a walk back to the original somewhere from somewhere else, when I heard a racing-car at the obvious top of a strong working gallop. Seeing was believing a moment later, both for that car and another, burbling as they went. And as, upon those particular days, practice of any kind had been mutually barred, and the glimpse I had of the drivers was as an impression of animated potato-sacks, one might imagine much Teutonism that has since been fulfilled, but know nothing for certain.

Still, one does not forget the shape of two racing cars exactly alike, where none should have been. By the end of that week, however, I had managed to see all the competing cars, except the three or four of the German team, and those other two. Which last addition did not seem to fit the list. So I waited, but not long, for by the merest chance I looked in to breakfast at a certain hotel of no importance, and heard some Germans eating. Then I preferred to smoke in the yard of that hotel. So when in another few minutes, one of those two cars was driven into the yard and those Germans came out and stripped off its bonnet, it was only natural that my way in to breakfast—I didn't hurry—should lead me close past that car on one side. Then somehow I forgot to have breakfast, so naturally strolled past the car on the other side, out of the yard, and back to my own hotel before I remembered I was hungry. That's the worst of smoking a

stale pipe before breakfast, it makes you absent-minded and disinclined for work. For I never saw that interesting motor again. I didn't need to. But I never heard that anyone else did. Which is the way of useless scoops.

[The guarding of the secret of the Mercédès racers which won the Grand Prix of 1914 was the pious duty of all good Germans at Dieppe before and during the race.—Ed.]

Oddly enough, one of those cars won that race. Yet not the same as that other one. For the motor on the winner displayed in Long Acre was nothing like it, except that it had four cylinders. Very soon thereafter came the war, which now seems to have begun years and years ago. So can you wonder that I forgot all about that motor until I needed to remember?

In the ordinary way, that would have been some time near next quarter day, and may be still. But some misguided person began irresponsibly gossiping about the new motors in the newest Zepps, and then—as you may have read—a quaint Hunnish airship recently discovered one of the *banlieux* of London in a blazing hurry with a bumping finish. Thereupon the British public—which will collect anything on earth if given the chance—started to gather in the remaining junk. Its rulers, jealous of their peculiar privilege of collecting aero-junk (vide Colonel Seely's "air fleet" of 1913), interfered and demanded restoration. And all Fleet Street, like one editor, applauded and encouraged both sides impartially, in breviter and half-tones of the same quality. Also the Huns, if you ask me.

I am sorry to say the infection spread upwards as high as the serene and generally pure air of the fourth floor of 166, Piccadilly. You know that terrible sparkle in the eye that confirms your worst fears for your dearest friend. Well, it was with just that sparkle that I was bidden to repair to the tented repository of the said junk, at Bunhill Row; and reconstruct those motors, as some dragon of the prime from his least toe-joint. Truly a job for an archæologist; or at any rate a better liar than I ever learned to be. So I left to do it, in sorrow and a Liverpool Street bus, after holding out as long as I could; until my notecase ached.

This, and the worse to follow presently, is the result.

Still, there seemed to be compensations. As I have already hinted, it is the outlawry conferred by the habit of writing for papers that really interests me; to be within sight and touch yet beyond reach of the police, and to spit upon their shadow for not being in khaki; while the opportunity of seeing an R.F.C. crew wrestle with sheer-legs, and tie parcel-knots with inch manila—as, indeed occurred for my delight—seemed too good to be missed.

Thus I entered at the strait gate of the H.A.C., Simply by asking to be taken in. So would probably any one of the mile-long London queue, if it had occurred to him as a law-abiding Londoner. Which is to suppose a miracle.

And then . . . the luck still held. Neither lightning nor any other destruction strikes twice in the same place, not needing to. So of the three motors, naturally none had been obliterated alike, or beyond total recognition as a motor rather than a discouraged handbill press. And best of all, recognition identified beyond doubt that forgotten and clandestine motor of German origin, in the hotel yard of no importance. Merely enlarged in bore and stroke, and from four cylinders to six. Otherwise wholly the same. I could have embraced that trinity of wreckage, only that it was very filthy.

It represented in any case, a highly elaborated rather than a complicated motor. Which is one difference without much distinction. Another is that it was a motor car design which had just succeeded in becoming an aeromotor, instead of a marine one, born to that honour.

But its first point, as to the cylinders, was that they were modelled as to the mass, exactly like the original Spyker motor of a dozen years ago, with drum-like jacketing about the heads; open back and front so that the packed jointing of the drum-flanges enabled all six cylinders to be jacketed as one for the head part, while the cylinders themselves—with their lower jacketing—were singly mounted; each jacket, however, being formed separately, and secured to its cylinder-trunk in a wire-bound flanged packing, no doubt, leak-proof.

Further, instead of the only-too-usual foot-bolts, each cylinder was cleverly secured by four curved yokes engaging a shoulder formed on it and held by the four through bolts supporting the crank-shaft bearings on either side.

Seated vertically in the cylinder head—and undetachably, so that the cylinder must needs lift to replace any one—were five valves; three inlets and two larger exhausts. These were operated—no rockers could do it—by a sort of carcanet of bell-cranks surrounding the entire top of the motor; the short outer arm of each one being lifted by a tubular rod closely snugged against the cylinder. The bell-crank sleeves being hollow, and united with short nipples, of course, provided with a union at either end, a completed oil-duct for all their lubrication, fed from below, and returned at the other end to the base-chamber.

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The induction was by way of a single omnibus tube, drawing mixture from a carburettor at either end; the principle of which, probably novel, was one of the most adequate, yet simplest things in the whole design. Two pressure-fed tubes led up into a small metal petrol-box, with no float, but a single perforation at the top. Over this, was a little brass shield-plate—also perforated—holding down an eccentrically mounted rotatable diaphragm, about the size of a shilling; the central hole in which varied in size—after the White and Poppé fashion—as it was rotated; so that the three parts combined to vary the petrol stream to a constant air supply.

Both carburettors being connected by a single control rod, completed the only visible departure from marine practice.

The mixture-chamber or casing of the rear carburettor, however, was very cleverly combined with the water circulation, in a casting of aluminium which comprised inlet and outlet in one piece, leading direct to and from the pump.

This piece, apart from the carburettor extension, consisted of a drum, with concentric chambers. Into the outer one, by way of two ports, the water was drawn down a trunk connection by a horizontal turbine—spun by light bevel-gearing from the crank-shaft—into a flask below: and then from that flask, forced upwards through a large spout to the radiators and thence back into the central chamber of the cylinder-drum casting.

Thus, there was no attempt to divide the streams of hot and cold water, merely to set them flowing in opposite directions under strong pressure, until they mingled. Than which nothing could be more adequate, or better calculated to preserve an even temperature all round the heads: the jacketing of which represented

a huge drain-pipe, as it was, clear as could be. Furthermore, connections led to and from a water-jacketed exhaust.

For the rest, bore and stroke were $5\frac{1}{2}$ in. by 8 in. Connecting-rods were square-sectioned but hollow to form oil leads to tubular gudgeon pins, set in the middle of shortish pistons, and secured by a single grub-screw from inside the pin.

A stout crank-shaft enabled both journals and crank-pins to be as short as possible, yet to provide good areas for cotter and through-bolts. Both were hollowed, but being fed from one side, not to form a complete so much as several local oil-reservoirs. And the webs being drilled hollow, and formed with scoops, the whole of the oil left over from the bearings, was thrown up against the cylinder walls.

Two plunger pumps, eccentrically driven off the rear end of the cam-shafts, and fitted with non-return mushroom valves for induction and delivery, attended to the whole lubrication; and a further gear connection from the main bevel of the water pump, with an intermediate governor control, rotated the two driving spindles of the magnetos. A most clock-like interior; but probably effective, as each magneto took care of the six plugs on that side.

Now you know the worst. I think we can manage to better some of it, nevertheless.—GEOFFREY DE HOLDEN-STONE.

[In other words, the secret of the Mercedes Grand Prix engines of 1914 was that they were in reality Maybachs, built in the Mercedes factory at Canstatt. From the racing-car Maybach the latest airship engine has apparently been developed. And it is not such an awe-inspiring engine as one might think. One hopes, therefore, that British aero-engine manufacturers will be invited to investigate and learn as much as possible from these engines, and from those of the other airships since brought down.—C. G. G.]

Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

FASHION—AND STYLE.

Distance lends inaccuracy as well as enchantment to the view. One cannot generalise, much less deliver judgment, without knowing all the facts. Otherwise it might be said that American motor-production suffered mostly from the defects of its chief merits. Two of the latter—as we were all taught faithfully before the war—are rapidity and quantity. We were also told quite truthfully, that it was a mistake to suppose that America could not turn out motor-products of the highest quality, if you were prepared to pay "bespoke-trade" prices.

The real kernel of the matter is that one has to choose between the accepted *chic* of Potash and Perlmutter, or the elusive, anticipatory art of Drècoll. You can have it cheap, and by thousands, excellent and conventional, and just inadequate. Or you can have the studious, original creation, which is, of course, very expensive, but is worth all the money because it gives such long service before it becomes common. You will be garmented in either case. But only in the latter—mostly a matter of detail—may you be sure of being ahead of all occasions. Which, as any woman will tell you, is more than the consolations of religion.

American motor-designers seem to have become bondmen to the Potash and Perlmutter way, so their laudable efforts at the Drècoll manner do not quite arrive.

THE IMPORTED VOGUE.

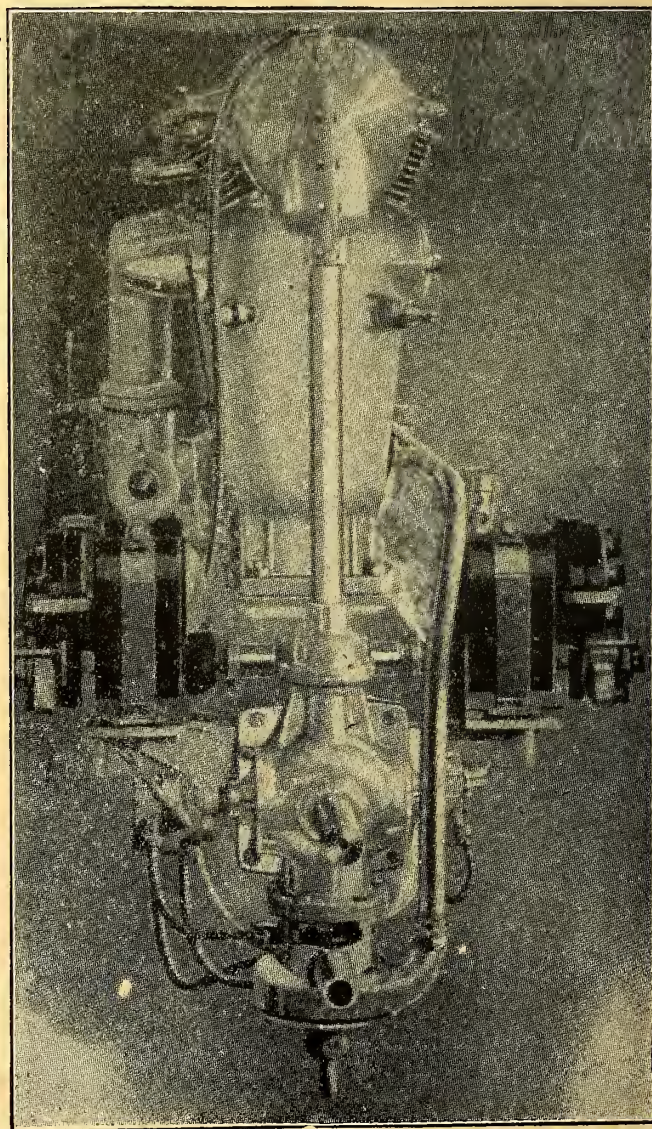
The six-cylinder, 140 h.p., and the twelve cylinder, 280 h.p., editions of the Wisconsin aeromotor are cases in point. For even if one examined no specification, when a four-stroke vertical or Y-type motor comes under the 4-lbs.-per-b.h.p. scale, its quality and refinement of material and make need little argument. As to the style of the design, in the "altogether," it might have left some first-class works in Milan or Turin—any time up to 1914. With its bottle-jacketed, rib-buttressed cylinders, it might particularly be an Isotta-Fraschini production of that date. One can almost see Mr. Potash of Milwaukee packing up the blue-prints.

Actually, I doubt whether any of the great Italian houses could—or would—have produced anything better up to this moment. The average Italian designer is little of a creative artist, and less of a physicist than a sort of monumental mason of motors; a simplifier of mechanisms from that point of view—a good one, nevertheless, though limited—rather than a student of special uses and working conditions. Hence your Italian chassis; admirably inaccessible as a rule. And—Brescia, believe me, is as commercial as Belfast. Neither can imagine a situation or an occasion without cheap labour and plenty of it. So may we judge faith by aeromotor works.

Now and again, the much more imaginative Englishman or Frenchman can. Which accounts for our extraordinary muniting, and is the chief assured hope of our entire superiority in aviation; of all pursuits the loneliest and most beset by the single-handed emergency, occurring unguessable miles from the slightest assistance. That over-ruling fact, therefore, we at least strive to keep in mind first and foremost; and design—or ought to—our aeromotors accordingly.

CONCERNING ITS POSSIBILITIES.

So—especially since the Bramco people of Coventry have taken up the British agency of the Wisconsin, and therefore may well



End View of the Wisconsin Aero-Motor 6-cylinder 140 h.p.

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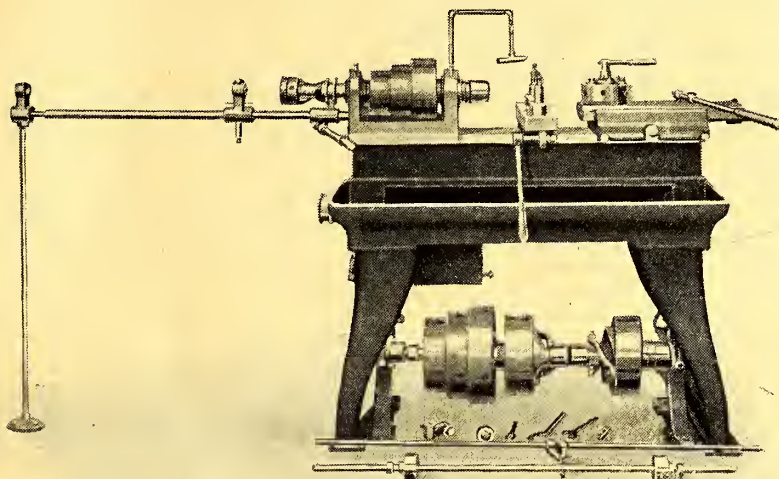
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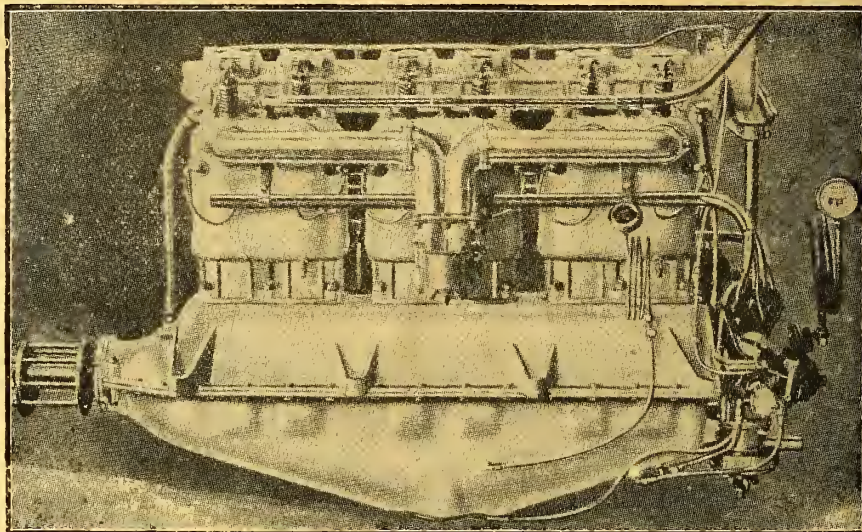
have some influence on its future design—it seems to be the practical thing first to identify its most evident type-origin; and then to examine it from that standpoint. With no intention to find fault with an obviously fine production, but to see where and how it probably falls short of use-requirements, and can be brought up to that standard, nevertheless.

One may have every confidence in the bases of the Wisconsin proposition. Its makers are known to have had exceptional experience in building track-racing motors. They know, therefore, just what material to use, and where to use it. Their choice of chrome vanadium steel in the mass of the construction we may therefore accept without question; and their statement as to the use of the Brinell tests and the scleroscope for all material, and the most rigorous shop-testing of the finished product only adds further assurance to our confident reception of the new product.

All may be well; so far. But the last test of all, the only one that matters, is the pilot-and-mechanic's-use test, and what they make of it at some forlorn landing-place, under all Service conditions. Where unless these conditions have been studied and served throughout the design—a worse-built motor might make a better showing.

IN THE MATTER OF VALVES.

There, as the illustrations show, are the fine mass outlines and



Inlet side of the 6-cylinder 140 H.P. Wisconsin Motor.

up-to-date detail of a first-rate aeromotor. What, then, is the first question with regard to any four-stroke motor, but its valves and valve-gear? Nothing, then, could be more satisfying than those great three-inch wide tungsten steel valves; or than their setting in diagonally at 25 degrees; nor could they be better or more simply operated, with greater saving of useless weight than with that well-housed and positively lubricated overhead cam-shaft and rocker-gearing; all adjustable to the nicest degree.

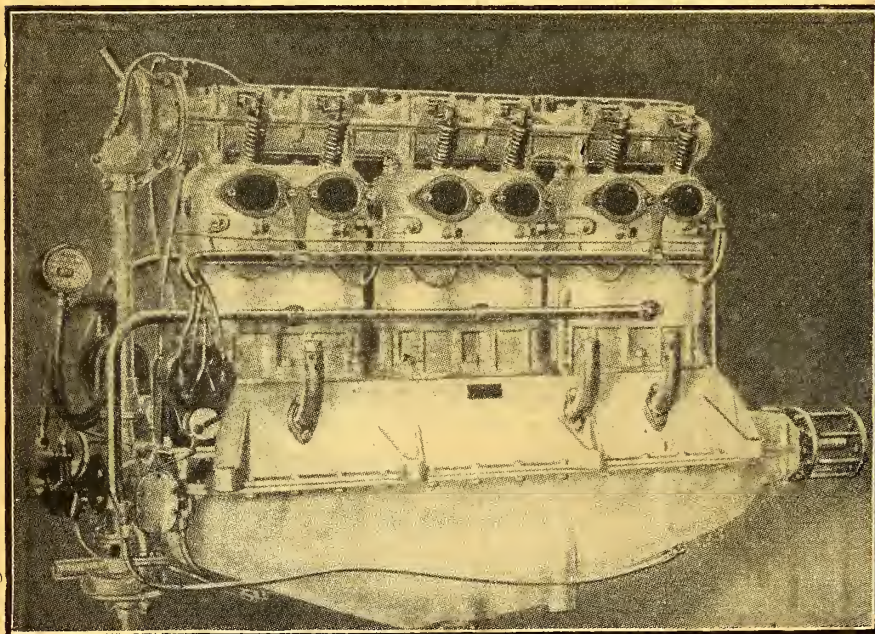
But this is supposed to be an aeromotor. Considering, then, how the valves happen to be mounted, it is with some foreboding that we learn that they seat directly in the cylinders and are not carried in cages; and the further statement that they are inserted through the lower end of the cylinder in assembling only confirms the worst.

From the aeromotor standpoint, it spells positive disqualification.

As I shall presently show: but, in the meantime, we may as well hear the rest. The absence of valve-cages, we are told, ensures better cooling of the valves. Which is as may be.

A SUGGESTION.

But if so, what is wrong with the idea of a skeleton or spider-frame valve-cage? Just three or four vertical bars between a disc-like top holding the valve-stem in a guide, and a ring at the bottom constituting the valve-seating: the said ring having two claws beneath to prevent the valve falling into the cylinder: the whole contrivance—merely the simplest of castings or



Exhaust Side of the 6-cylinder 140 H.P. Wisconsin Motor.

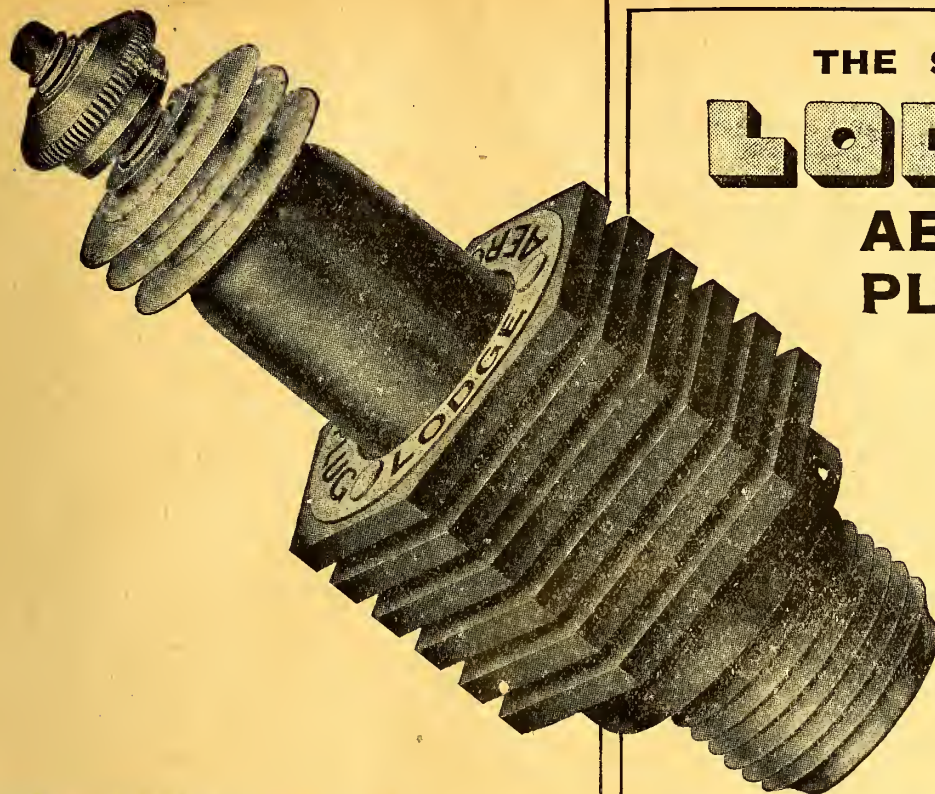
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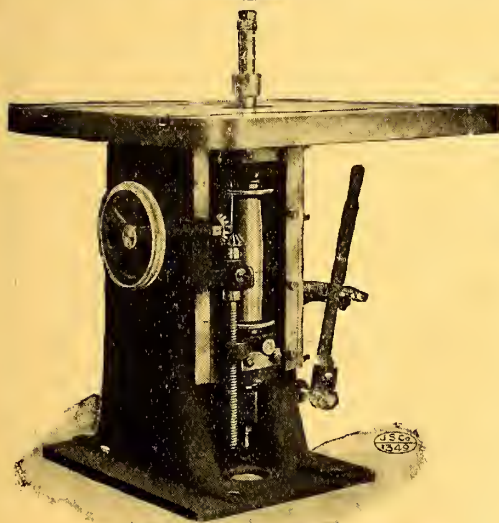
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stampings screwing into or "otherwise conveniently secured to" the cylinder casting?

Nothing there to hinder cooling as rapidly as ever. Nothing a millimetre wider than the prescribed valve areas already allow!

We gather—as in a dozen other cases—that tungsten steel is used for the valves so that they shall require "very little" re-grinding.

As a necessity or a result, there it is, anyway. But with the simple device suggested, very little stripping of adjacent parts need be done in a hurry. Which is always a Service consideration.

Very much a necessity, too, when, as a matter of fact, with a dirty sample of spirit or indifferent carburation—a matter not altogether likely to be invariably ideal in this case, as I shall show—a tungsten steel valve is as liable to carbon deposit, pitting, and the need of regrinding as any other is. Yet with such a readily detachable seating, no grit or foreign matter need fall into the cylinder. Incidentally, those two little claw-pieces do away with the need for that "inner auxiliary spring" which is fitted. Likewise its weight, and the trouble of fitting it. Or, worse, in view of that trouble—the risk of its not being fitted, and the valve or spring-failure arriving according to schedule.

AS THE MATTER STANDS.

But as it is, let us see just what has to be done in the way of dismantling the motor.

Four spark-plugs have to come out, and clear of the mass.

The induction and exhaust manifolds must come off. Kindly count those dozen bolts and packings.

Then the water connections—a dozen more, rather smaller and easier to mislay—and their union with the pump.

After that, the entire overhead valve-gear, which does *not* rock back, Maudslay-fashion, from a universally jointed vertical shaft. This last may stand, but there are at least ten small nuts to slack off—and re-thread on their bolts—before the bevel-gear casing releases. And then there are those dozen standard bolts, holding

down cam-shaft and casing, and the two oil-pipe connections of the latter, to slacken off, before that lot comes adrift and lifts clear.

Then there are only six more nuts—on the cylinder foot-plates—to ease off. And then at last—taking care how you ease out two pistons at once, this being a twin-cylinder proposition—you can lift two cylinders clear. By which time, you have a nice *gachis* of motor parts duly dispersed around you.

All to get at, and replace or regrind one single defaulting valve! Nevertheless, it must happen just so.

And when this has been duly done, you have got to put every thing back where it was, and exactly how it was.

By which time you have probably got quite fond of hirsute Latin-American aeromotor propositions, even with all the conveniences that naturally abound at The Base.

Only, how about it, on the weather side of a wood, goodness knows where behind enemy lines, with a certain liveliness in progress? You are certainly up to a very long-odds, sporting proposition. But this is War.

So having strong regard for your useful—and I dare say precious—life, I am inclined to insist on a change to detail-detachability in the otherwise excellent Wisconsin design before it gets into any British aeroplane. So much may depend on fulfilment of the ostensible function, which is not gear-work.

THE ESSENTIAL CHANGE.

Let us see how. Now apart from the fact that casting valve-stem guides in one with cylinders is bad designing and worse foundry practice, we have literally got to have some sort of detachable valve-cage and seating. With at least twenty-seven square inches of cooling surface for the cage of a three-inch valve, only three inches deep, there is not much fear of overheating even a closed barrel-type cage. With my skeleton-cage idea there is positively none. One or other is an essential thing anyhow.

(To be continued.)

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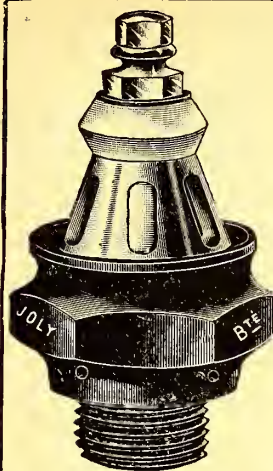
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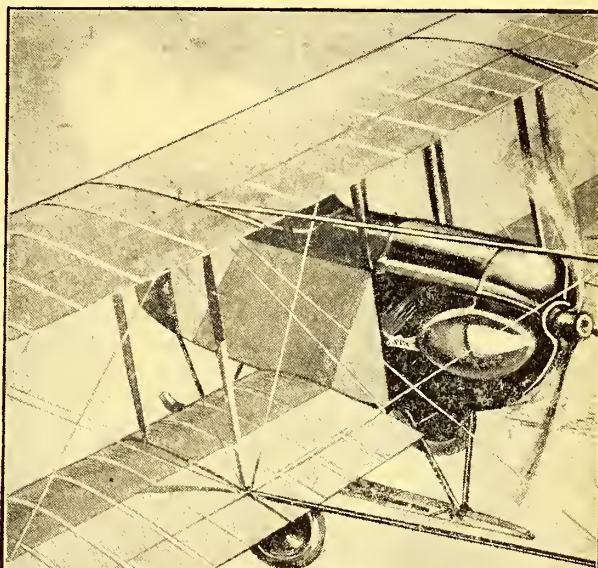
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COMPENSATION FOR MUNITION WORKERS.

The Minister of Munitions has made the following announcement:—

"If a munition worker (as defined by the Munitions of War (Amendment) Act, 1916) is on or after October 1st, 1916, killed or injured by hostile aircraft, or by the measures taken to combat them, whilst upon the premises of the factory in which he is employed, and if the injured worker or his dependents on proceeding under the Workmen's Compensation Act, 1916, fail to recover compensation, His Majesty's Government undertake to pay compensation on the scale of the Act."

[Now that this hard-and-fast regulation has been laid down for the protection of munition workers' dependents it is to be hoped that the authorities will not permit work to cease at munition factories on the approach of hostile airships.

And if the pampered munition worker—who is not infrequently a shirker or trench-dodger—is to be specially considered, what about the short-handed over-worked shop-keeper whose existence is necessary if the creature needs of the highly-paid munition worker are to be satisfied?—Ed.]

REFUGIUM PECCATORUM.

At Aldershot on Sept. 28th Vivian Clifford, 26, an employee at the Royal Aircraft Factory, was fined five guineas for stealing a shopmate's bicycle. Another employee, Charles Hayman, 27, was sentenced to four months' imprisonment with hard labour on charges of stealing motor-cycle parts, value £30, from his fellow-workmen. It was shown that since July Hayman had been dismantling motor-cycles and transferring fittings to his own machine. Nine witnesses from the Aircraft Factory were in Court, all young men of between 20 and 28.

The magistrate refused an application by Clifford for time to pay his fine, whereupon his shopmates raised the money among them.

A DATE.

PICKLES—MARKS.—A marriage has been arranged between Mr. Sydney Pickles, of Australia, and Miss A. R. E. Marks, of Hampstead. The ceremony will take place on Nov. 4th next.

CONTINUAL PROGRESS.

One hears great accounts in these days of the new Sunbeam-Coatalen engines, and one of the minor sorrows of the war is that one is debarred from describing them for the benefit of an admiring world. Considering that it takes some years to perfect an ordinary car engine—and that most of them are a very long way off perfection—the Sunbeam aero-engine has really done surprisingly well since its first introduction in 1914. The original 120-150-h.p. eight-cylinder job was quite a good effort, for though too heavy to do the trade of a featherweight rotary of approximately the same power, it was very fairly reliable, and it was economical in petrol, so that it has been a most useful engine for school seaplanes, where no vast load of petrol is needed, and where only a pilot and passenger, without bombs or armament, are carried.

The 225-250-h.p. twelve-cylinder engine has also done good work. True, the early types had trouble with the demultiplication box, owing to the outer end of the main shaft being left to depend on the end main bearing, which refused to take the thrust of the propeller gear unless supported by an outside gear-wheel.

Also there was lubrication trouble, owing to the oil being pumped round and round inside the engine so rapidly that it all got hot at once and ceased to lubricate. This trouble was partly cured by cooling the oil in a special radiator, and later, one gathers, by adopting the alternative plan of merely giving the engine the oil it needed and letting it burn it away, while fresh oil was automatically fed to cylinders and bearings.



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KINDLY MENTION "THE AEROPLANE"

Both these troubles have vanished for good in the later engines, for one of the great secrets of Mr. Louis Coatalen's success is that he is never too proud to learn, and if he finds that he has been wrong in his assumptions or that someone else has a suggestion for an improvement, he is always quick to make alterations. He believes in the American theory that the road to success is to make what people want, not to try to make people want what you make. All the same, he is always ready to give chapter and verse for his reasons for making what he did as and how he did, for Sunbeam-Coatalen engines are designed as they are after due consideration; they do not merely happen that way.

However, having found that pilots want more and more power for less and less weight, Mr. Coatalen is now providing engines accordingly. His latest products are of a brake-horse-power and of a weight per horse-power undreamt of a couple of years or so ago. One of his new engines has more power than would have supplied twenty of the queer old things which used to drive aeroplanes six or seven years ago, and the weight of the engine is a mere nothing compared with those of that period; in fact, the weight per horse-power is now down to that of the rotaries, without entering into any argument as to petrol consumption, and total weight when loaded for six-hours' run, or anything of that sort.

Very material differences have been made in the valve positions, and in the disposal and shape of the cylinders, and there are various interesting details of design which would make interesting reading if one were allowed to describe them.

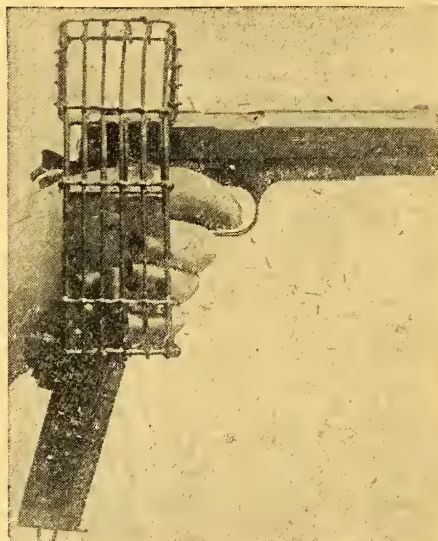
In this case there is really good reason for not doing so, because, unlike most things the publication of which is prohibited by officialdom, the Hun might really learn something.

One can only hope that when the new engines are ready for delivery in quantities they will be put into real aeroplanes, properly tried out at home, and then sent out on active service in big squadrons, where their power and efficiency will really be used in intimidating the enemy. The High and Wise Command will do well to refrain from sending them out in ones and twos and presenting them as samples to the Hun, as happened with another new engine recently; and from putting them into officially designed freaks and wearing them out in taxying furiously up and down the sea in a vain effort to get off; and from sending them out to strafe wild niggers of the wilderness who would be equally impressed by an 80-h.p. school machine or a R.A.F. B.E.2c.

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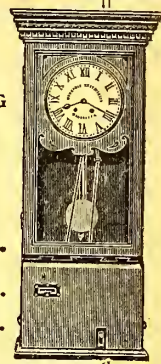
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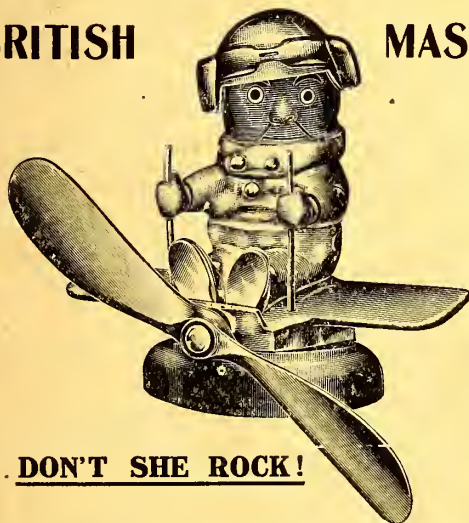
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Germany before long as all the Zeppelin plus Maybach combinations have caused in this country. Meantime, one congratulates Mr. Coatalen and the Sunbeam Motor Co. on their well-deserved success, and on their continual seeking after absolute perfection. One may be sure that the quick Celtic brain of Mr. Coatalen will always find room for further improvement, while, at the same time, his sound French common sense will prevent his inventive faculty from spoiling the engines as a manufacturing proposition. "Output and Improvement" might well be his motto.

AN EFFICIENT PISTON METAL.

A great deal of experimental work is being done at the present time with regard to the use of aluminium alloys for aeroplane engine pistons, and some very successful results have been attained because of the resultant diminution of weight and the consequent reduction of inertia forces.

It has also been found that owing to the high conductivity of these alloys an engine can be run under higher compression and at a greater speed than can an engine with cast iron pistons, before pre-ignition sets in.

An alloy which has attained great success in the United States, known as Magnalite, is now being handled by Bramco, Ltd., of 1, Ellys Road, Coventry. This alloy has been successfully used

in many American racing motors and also in American aero engines, and its introduction over here should result in considerable improvements in British engines.

Compared with cast iron Magnalite scores on every point. Its specific gravity is 2.59 as compared with 7.218, weight in lbs. per cubic feet, 161.5 as compared with 450.08 lbs., thermal conductivity 92.0 as compared with 11.90, compression strength, 128,000 lbs. per square inch as compared with 90,000 lbs.

Taking the tensile strength of Magnalite in relation to its weight, it is as strong as steel of 80,000 lbs. per square inch.

A comparison of the inertia stresses of Magnalite and cast iron is most interesting. At 1,000 r.p.m. it is as 69-210, at 2,000 r.p.m. it is 276-840, at 3,000 r.p.m. it is 621-1,890. Of course, the inertia stresses set up by reciprocating parts are more detrimental to the run of an engine than their actual weight, but in an aero engine the difference in the weight of a set of cast iron pistons and Magnalite pistons is quite appreciable. For instance, a cast iron piston weighing 4.75 lbs. only works out at 1.75 lbs. in Magnalite, a difference of three lbs. per piston, and in a big 12-cylinder engine of course the difference would be even greater.

A car motor was fitted alternately with cast iron pistons and with Magnalite pistons and run in each case for 7,000 miles at 1,200 r.p.m. It was then run on a brake test with the following

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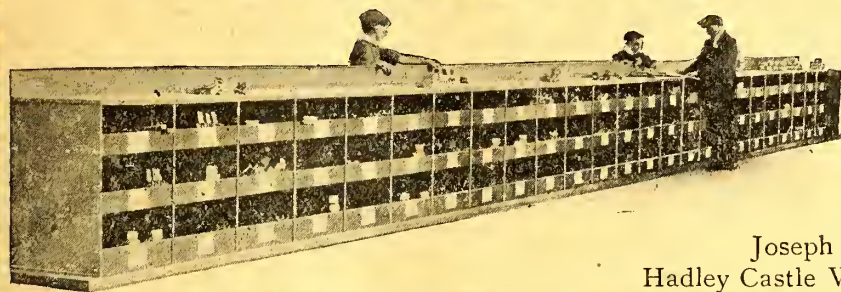
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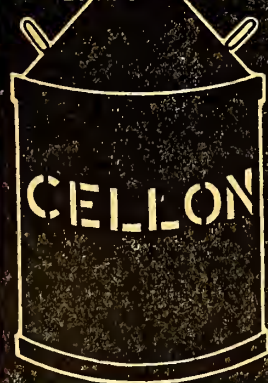
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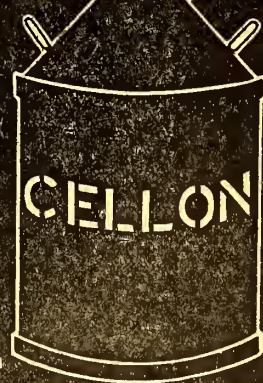
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result. With cast iron pistons with a clearance of .006-.003 in., the water in the radiators being 132 deg. Fah., the engine gave approximately 64 brake h.p. at 1,800 r.p.m. With Magnalite pistons with a clearance of .010 in., the water in the radiators at 150 deg. Fah., 84 brake h.p. was attained at 2,200 r.p.m.: in each case the throttle was wide open.

Engine builders who have used Magnalite pistons speak highly of the way it stands up to its work and the remarkable increase of power it shows.

The alloy makes clean castings and machines very rapidly and altogether it should be a very useful material for engine builders.—W. L. W.

A NEW "HARLEY STREET."

The "Motor," of September 19th, contains a rather amusing account of the manner in which an American visitor discovered the location of the Barimar factory in Lamb's Conduit Street. He tells the story in the following words:—

"I had come a cropper metaphorically," says the visitor, "and a bad patch upon an irreplaceable part of the car was both unsightly and inefficient, and in this dilemma I was directed to Lamb's Conduit Street, where I detailed my troubles to a silent but sympathetic Englishman, who led the way to a maze of buildings teeming with men and machines working as if for dear life. 'Say,' said I to my silent, insouciant guide, speechless and solid as Scottish granite, 'It's mighty kind of you to bring me in here, but I didn't ask you to take an inventory, or I'd have brought a bunch of stenographers. I just want to know right now whether you can get me out of trouble, and quick!'"

"By now we had got up five floors of machinery, I think—a sort of small block of skyscrapers, not as fine, of course, as the American variety. I got no audible answer out of my Englishman, but in his imperturbable manner he merely pointed in the Harley Street way to another 'patient' under repair. There I beheld almost the counterpart of my own trouble, a vital part with a huge excrescence of metal, eloquent of unskilful, inefficient treatment. Standing over the prostrate part was a swarthy spectacled 'doctor,' who directed the flame from a blow-pipe upon the disfigured joint. Invited to examine it, I approached, with goggles, and to my surprise saw the solid steel melt like butter, and move in small almost imperceptible waves, reducing and clarifying the excrescence, which later on I saw machined and burnished, until I began to wonder whether 'things were what they seemed,' or whether I had merely had a bad dream. There, surely, was my vital, irreplaceable part, in all its pristine beauty and strength, for I saw it subjected to a severe strain and emerge unscathed.

"In my transatlantic way I thanked profusely this Harley Street physician in Lamb's Conduit Street—a real genius in his craft, who, I guess, had addressed to me exactly 24 words, just as a mean American might hand out a costly cable to President Huerta or one of the other temporary holders of grandiloquent Mexican titles. 'Some job,' thought I, as I walked away from Barimar's Scientific Welding Works, soliloquising on the great difference between merely saying and doing things, and decided to write Barimar with my acknowledgments."

Comment would spoil the story. It is sufficient to point out that the Barimar process covers absolutely any and every type of metallic repair that could possibly be carried out by welding, and in many cases sound jobs can be made of fractures which the average engineer would declare to be hopeless.

AERO-ENGINE MAGNETOS.

At last people in this country are beginning to realise that there are certain key industries which must be fostered so as to prevent other important industries from being entirely dependent on foreign manufacturers. Not only the Aircraft Industry but the whole Motor Industry suffered in the early part of the war from the almost entire absence of British magnetos. In the usual British fashion it has taken months to discover what ought to

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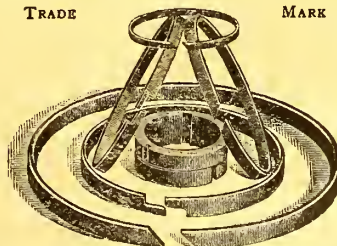
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Before leaving the factory the magnetos are thoroughly tested and examined by the A.I.D. officials, and the performance of this machine has proved both the excellence of the firm's product and the thoroughness of the examination.

Already the existing works are found to be too small, and extensions have been ordered as well as the additional machinery necessary to equip these extensions. The Treasury has sanctioned an issue of £50,000 extra capital which is being issued in 8 per cent. Cumulative Preference shares of £1 each. The firm are receiving financial assistance, free of interest, from the Government, and already hold orders to the value of something over £20,000, which covers instructions to supply some 400 magnetos a month to the Flying Services.

Other departments are also ordering from the firm as well as the French, Russian, and Italian Governments, so, altogether, the

prospects of the firm, both during the war and thereafter, are decidedly encouraging.

One is naturally glad to see a firm which started in such a small way of business, and which fought its way steadily along through bad times, thus coming into its own on its merits. Any communications respecting the firm should be sent to Trafalgar House, 11, Waterloo Place, London, S.W., and letters regarding the firm's products should be addressed to the Fellows Magneto Company, Ltd., Cumberland Avenue, Park Royal, Willesden, London, N.W.

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"Such a device would be possible if some strong monochromatic light were used, but these lights are expensive and very trying to the eyes if used for any length of time."

[The subject is really one well worth investigating further, for it would be of great use to aircraft factories, where sky lighting is so much used, if it were possible to glaze the roof with a coloured glass which would admit daylight, and would yet cut off the rays of the particular form of light used for illuminating the workshops at night.]

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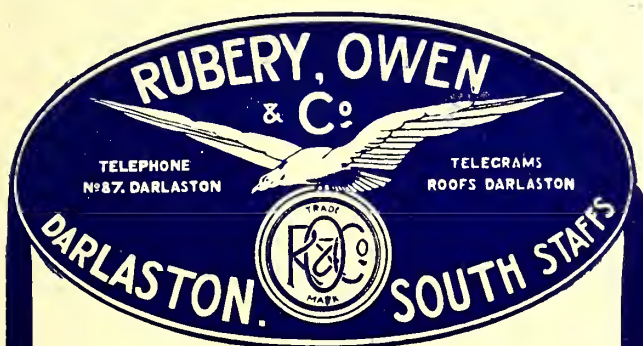
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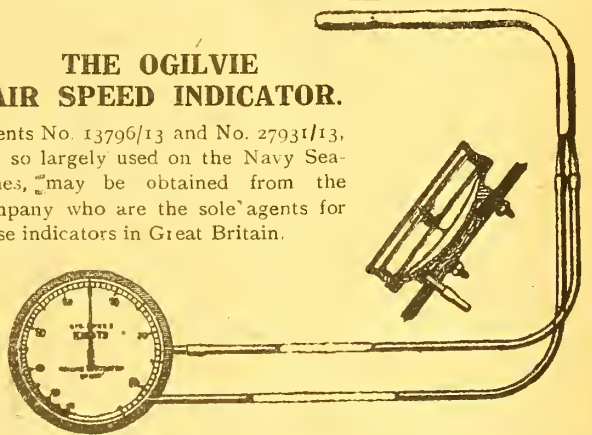


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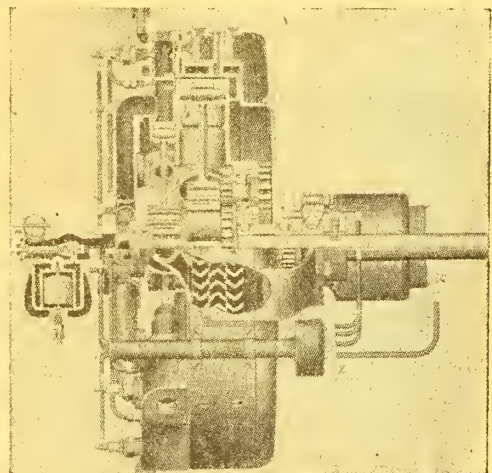
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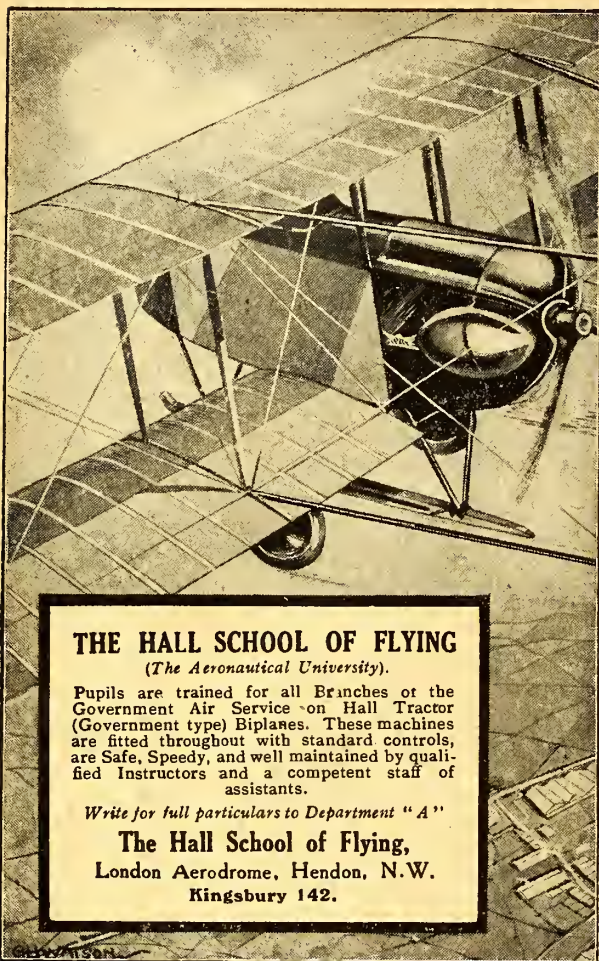
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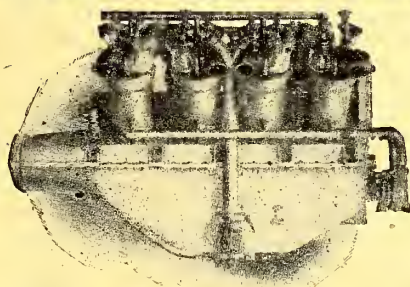
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ON A MATTER OF HORNETS.

One of the commonest and cheapest jeers of certain papers which have adopted anti-Churchillism as part of their political creed is the constant jibe at the late First Lord of the Admiralty that the defence which he promised against enemy airships has not been forthcoming. It is now many, many months—in fact, it runs into years—since Mr. Winston Churchill informed the world that, if enemy airships ventured to invade this country, they would be met by "a swarm of hornets" which would make them regret that they had ever come.

At that time the defence of England was entirely in the hands of the Navy. The Army was still piously supposed to be the Expeditionary Force. Naturally, as part of the Navy, the R.N.A.S. was supposed to be responsible for the defence of the country against aircraft: a perfectly logical position, and an eminently sensible one, for the Navy has always been able to obtain all the money it has wanted for any scheme it might have in hand. Consequently there seemed to be no reason why Mr. Churchill's rhetorical phrase—to which one might have returned the time-honoured question, "Is that a threat or a promise?"—should not have become before long a literal truth.

There was one point on which all of us seem to have tripped up, however—namely, that in talking or thinking of invasion by aircraft we all pictured to ourselves a fleet of machines coming over in broad daylight, and the world's aerial navies grappling in full sight, complete with central blue as fitted. That is the worst of these poet chaps; they do put such silly ideas into one's head, and the ideas stick because they have a pleasing jingle of words connected with them. For example, people think a lot about flags and suchlike, because Solomon sang about "terrible as an army with banners." Yet an army with tin helmets and gas-masks and belts full of bombs, and clad in mud-coloured clothes so that it isn't seen at all, is far more terrible, for the poor old banner-bearers would simply be a target for every shooting-iron within miles.

None of us seems to have had the sense to see that nocturnal invasions would be very much more effective, both morally and practically, than any daylight show could have been. Feeble psychologists as the Germans have proved themselves in most things, they certainly found a winner when they backed the terror that walketh in the darkness.

If they had sent their airships over early in 1915, in daylight, they would certainly have been wiped out by aeroplanes. We had very few aeroplanes then: not a fraction of the number we should have had if the supply of engines and machines had been properly handled before the war by the Government. But, nevertheless, we had some few, such as Sopwith tabloids and Bristol scouts, quite capable of reaching and catching and destroying any airship of that period, if it could be seen. The destruction of the very first Zeppelin ever brought down by an aeroplane—that which ultimately wrecked itself after being damaged and made uncontrollable by

Squadron-Commander Bigsworth, R.N.—proves it, for this officer was flying a standard 80-h.p. Avro, a considerably slower machine than either of the single-seaters mentioned.

The Germans spotted this quickly enough, and so their ships only came over at night, with the result that for over a year they came and went unhindered, so far as defensive aeroplanes were concerned. The only people who suffered were the gallant young officers of the R.N.A.S. who went up to try to abolish the airships.

SOME RESULTS OF UNORGANISED NIGHT-FLYING.

The Admiralty, ever honest and straightforward, even where its mistakes are concerned, published openly the names of those killed in these operations. Young Mr. Lord, of Newcastle, was, I believe, the first victim. He was killed in the South of England when trying to land a fast scout in the dark. Much about the same time Mr. Hilliard was killed through the bombs he had on board his Caudron exploding as he landed. Mr. Richard Gates was killed when landing a Henry Farman in the dark. Mr. Barnes was killed through landing a big Sopwith pusher in the early morning fog after flying all night. There may have been other deaths, but those are all I recall offhand in the early part of 1915.

There were many other officers injured, and still many more marvellous escapes. I told the other day how an officer jumped out of his machine near the ground, chancing where he fell rather than risk being blown up by his bombs.

Another officer had a still more extraordinary experience. He landed on a Caudron, and his bombs blew up. Subsequent investigation showed clearly where his skids first struck the ground. About 25 yards farther on was the wreck of the machine and engine, all burnt to bits by the petrol set on fire by the bombs. And about 20 yards farther still was the place where the pilot had finished having a private fire of his own.

Seemingly the first shock had jarred and bent the stems of the bombs and released the firing mechanism. The second shock had exploded them, had blown the whole machine to pieces, had burst the petrol tank so that the spirit splashed all over the pilot and caught light, and, finally and fortunately, had blown the pilot clean out of the machine into some longish grass, where he fell without being stunned, luckily, and rolled over and over till he put the flames out. I gather that his worst injury was a rather burned hand, due to his glove falling off while he was beating the flames out on his coat.

THE LACK OF PROPER MATERIAL.

All this night-flying on unsuitable machines was very gallant, and very dangerous, and very useless. Flight-sub-lieutenants and other young officers, right up to the rank of squadron-commanders, were eager and willing to take it on, because it was adventurous, and because, I suppose, it made them feel that they were "doing their bit"—that hateful phrase which covers and acts as an

excuse for all sorts of wasteful foolishness. There was presumably some satisfaction in taking an entirely useless risk as a salve for one's conscience because one's brother in the Army was taking necessary and useful risks in the trenches in Flanders.

And seemingly no senior officer knew enough to stop all this waste of men and machines and set things right. There has always been difficulty in the R.N.A.S. in getting the very best men from the Navy for the responsible jobs between the officer directing the whole R.N.A.S. and the comparatively junior officers commanding squadrons and air stations. And naturally in wartime the Sea Lords were not going to let the Navy, which has always been short of officers, hand over any of its best men to a branch of problematical value—for remember, in the early days of the war, the Navy as a whole regarded the sphere of the aviator as being halfway between the circus ring and the lunatic asylum.

Even now some older Naval officers seem doubtful where aircraft are of any real importance, though they think rather well of airships, because they look so big and important. That is the worst of growing up with one's outlook on life limited by a ship's scuttle.

The officer then directing the R.N.A.S. was not to blame. He could not get the senior officers, and the subordinates he did manage to secure let him down time after time. They persuaded the authorities to order a heap of B.E.2cs. with 70-h.p. Renault engines, machines which were useless for war purposes, though nice enough for peace touring. And they went on with sundry experiments on machines which may be developed to their ultimate stage in time for the war after next, or with luck for the next war. Thus they wasted thousands of man-hours and tons of material which might have been put into real war machines.

Even early in 1915 there was plenty of knowledge to have produced powerful inherently stable (uncapsizable) machines which would have been safe to fly in the dark. And if such machines had been produced, they might have been used for defence against enemy airships at home, and for raiding German airship factories abroad—provided, of course, that there did not happen to be any highly placed official who was a conscientious objector to retaliatory frightfulness such as has since been carried on by the French and the R.F.C. and the R.N.A.S.

Also, general mismanagement of the whole question of matériel caused delays in production of such machines as were ordered, and caused the production of the wrong machines. Theorists, basing their calculations on insufficient data and on erroneous assumptions, hindered the building of useful machines designed by practical men who knew their jobs. Inspectors who knew nothing about design, workmanship, or material, wasted quantities of stuff which might have made good aeroplanes. Factories were short of work because orders to keep them going were held up till previous orders were completed, or because some official wanted to display his authority, or because someone had forgotten to dispatch some document or other. And the men at or near the top were unable to sweep out inefficient subordinates because the men to replace them could only be drawn from active-service squadrons who could not spare them.

WHY NO HORNETS APPEARED.

The result of it all was that Mr. Churchill's "swarm of hornets" never came into existence at all, even for daylight flying. And when Mr. Churchill left the Admiralty, his driving force and energy, which might have forced through the development of a great Naval Air Service, went with him, and was succeeded by the cold, scholarly atmosphere of Mr. Balfour, who has never, so far as I can gather, manifested any keen interest in aeroplanes since he once took a jaunt round Hendon on a box-kite.

To carry out the entomological simile, when the incubatory warmth of Mr. Churchill was removed, the poor little hornets languished, and were ultimately killed by the Balfourian frost.

[N.B.—Put any construction you like on the word frost.]

Let me here state that I am no violent supporter of Mr. Churchill. Personally I am strictly neutral. Mr. Churchill has his good qualities and his bad. He acts, and causes others to act in obedience to him, without calculating results, and so he produces chaos, not because his ideas or aims are wrong, but because he does not make sufficient allowance for the congenital incapacity of the people who have to carry out his instructions, or because he believes everyone to be honest and patriotic, and does not allow for snags in his schemes raised by personal and Service intrigues, or graft, or jealousy. He is a statesman, but he is not a clever politician. If he had a smaller mind, he would do greater things. As it is, the great things he wishes to do fail because of the small minds to which he has to delegate the carrying out of the details of his ideas. The Antwerp failure, the Dardanelles failure, and the "swarm of hornets" failure were all partial successes, and might all have been full successes but for the frailty of human nature, for which Mr. Churchill did not make sufficient allowance.

He thought that everyone had his abounding intelligence and his boundless energy and enthusiasm. What he forgot was the officer who must have his cocktail and cigarette before lunch and before dinner, or who must stop and have a yarn with every pal he meets. These and such minor things as these are what make all the difference, and total up to so much time wasted in non-productive man-hours.

Nevertheless, the scheme of the "swarm of hornets" was perfectly sound, just as the scheme was sound for the "swarm of caterpillars"—otherwise "tanks"—which was at once recognised as such by Mr. Churchill when it was first submitted to him.

And the soundness of both schemes is now being proved by a series of partial triumphs in the air in England and on the ground in France at a time when, but for the entomological inexactitudes (to parody a *bon mot* of Mr. Churchill's) of those responsible for the hatching of these insects, we might have held as complete command in the air and on land as the plague of locusts did in Biblical Egypt.

So much, then, for what might have been and what has been. From which let us pass to what is. And here we find a much more cheering picture.

ON NIGHT FLIERS.

A certain well-known comedian gets a laugh every night (bar Sundays) and two matinées a week by propounding the scheme of crossing bees with glow-worms, so that they can work overtime. Quite independently of this brilliant notion, the officers who now control so ably the destinies of the R.F.C. have arrived at something very much like it, in that they have produced a new and improved species of the hornets which Mr.

Churchill promised and could not supply, for the new breed flies by night. The British Public sees but little of this night-flying hornet, but the Hun *luftschiffer* knows him to his cost.

The fact that when the Hun makes his close acquaintance he does not return to Germany to talk about it makes it undesirable to say much about the night-flier's methods, but it is only fair to him and to those who have

produced him that his existence and his prowess should be duly acknowledged. Hence the following section of these notes.

It has now been made known officially that the Cuffley airship, numbered L.21, was brought down on fire by an aviator, Mr. Robinson; the Zeppelin L.32 was set on fire by Mr. Sowrey, acting in conjunction with Mr. Brandon, who had previously distinguished himself by assisting to bring down the Zeppelin, numbered L.15, which sank in the Thames—in fact, it is believed by some that he brought it down unassisted. The Zeppelin L.33 was apparently damaged by gun-fire from the ground, and further damaged by Mr. Brandon; and the last to be brought down at the time of writing, that which fell at Potters Bar, was officially stated to have been attacked by guns and aeroplanes, though the fact that there was no gun-fire for some little time before the ship caught fire seems to show that the final touch was given by an aviator.

A BADGE FOR NIGHT PILOTS.

From the scale of awards to the various aviators one surmises that German airships are now officially regarded as becoming fairly cheap. Mr. Robinson received a V.C. Mr. Sowrey and Mr. Brandon get a D.S.O. apiece, which in the case of the latter seems a deserved addition to the Military Cross awarded for his L.15 exploit. And presumably the pilot who brought down the L.31 will receive a Military Cross. After which there will probably be no awards, but merely a mention in despatches for the next batch of Zeppelin destroyers. Following the logical sequence of this arithmetical progression of decreasing values, one may in some months to come expect pilots to be cashiered if they permit any invading airship to escape. As has been remarked on previous occasions, it is a terrible war.

Personally, I think that, always excepting the R.F.C. observers, the night-pilots have the most nerve-racking job of anyone in the Corps, and, if a humble suggestion be permitted, I should like to submit that they be given a special badge. The "liver wing" of the observers indicates a singularly worthy occupation. Why should not the night-pilots be likewise distinguished?

It is the pleasing fancy of some of the night-fliers to decorate their black machines with a skull and cross-bones neatly but not gaudily done in white. Perhaps a similar chaste device in silver, to be worn immediately under the R.F.C. wings on the left breast, might be suitable. Our 17th (Lancer) regiment of cavalry already wears this significant emblem, as do the Prussian "Death's-Head Hussars," of which His Imperial Highness Little Willie is the Colonel-in-Chief; but that need not cause confusion, nor prejudice the suggestion.

Where all run similar risks, and where success is so much more a matter of luck than of pure judgment, it seems fair that all should share the honour.

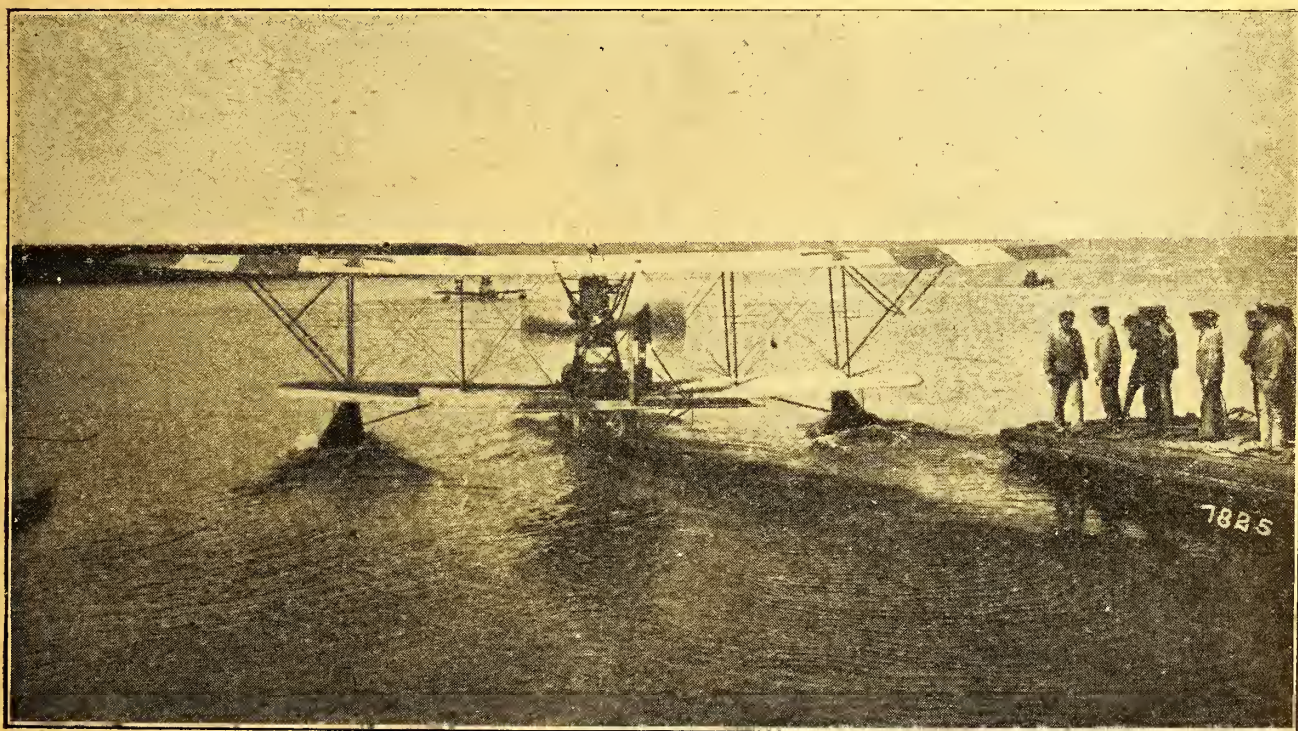
THE STRAIN OF NIGHT-FLYING.

The actual bodily peril of flying at night may not be as great as is the peril of crossing the German lines in broad daylight, but the nerve strain must be greater. The aviator over on the German side of the lines has generally something on hand to keep him from brooding, such as a battle with a Hun machine or the dodging of Archie's best shooting, and he generally has a passenger by way of company.

The night pilot, on the other hand, flies entirely alone. He flaps around for hours on end, with nothing to do but think and keep a look-out for other aircraft. And nothing is so great a strain on the nerves as unlimited time for thinking, a pastime for which the pilot has considerable leisure now that all respectable aeroplanes are inherently stable, and so fly themselves without any attention.

If there is any mist about, there is the constant danger of collision with other machines, for in the dark there is not even that chance of dodging which a pilot gets from the few seconds during which he can see another aeroplane approaching in a cloud which is illuminated by daylight. Over and above it all is the constant imminence of the landing problem, with the prospect of being smashed up, and possibly burnt to death, if the pilot makes a mistake, or if luck is against him.

It is true that the lighting of aerodromes has been very greatly improved during the present year, and that new systems of landing lights give pilots a far better chance



A Lohner-Daimler Flying-Boat leaving an Austrian seaplane station. It may be noted that the Austrian machines bear the German cross (metaphorically as well as literally) in addition to the Austrian tricolor.

than they ever had before. Also, in case of a forced descent where no aerodrome exists, most night-flying machines carry their own means of illuminating the ground below for a time long enough to give the pilots a sporting chance of avoiding houses and trees.

A RUSE DE GUERRE.

Incidentally, there is a story current among night-pilots, which I do not believe, but which may be worth telling, if only as a warning to officers who may be put in command of night-flying aerodromes, and who may be moved to exercise a too exuberant ingenuity. According to this yarn, a certain officer in charge of an aerodrome, realising that his landing lights, which in those days were open petrol flares burning all the time, would be seen by airships as well as by his own pilots, deduced therefrom the great thought that, if an airship came over his way, it would doubtless bomb the aerodrome. Which would naturally annoy him considerably.

Therefore, being one of those brainy persons, he be-thought himself of a *ruse de guerre*—unfortunately, after the night-pilots had gone up. Forthwith he had the flares removed from their usual places and placed all round a wood, some little distance from the landing ground. Then he retired peacefully to the aerodrome, happy in the knowledge that if a Zeppelin, or even a Schütte-Lanz short of aluminium, arrived, it would bomb the wood and leave his beloved sheds in peace. But, unfortunately for him, instead of an airship arriving, his own pilots came back unexpectedly early, and proceeded to squat as neatly as might be on the tree-tops, considerably to the detriment of sundry perfectly good aeroplanes.

As I have said, I do not believe the yarn, not that I do not know several officers capable of such misguided ingenuity—for instance, the little gentleman who sent a wireless wagon roly-poly fashion down a steep slope as the quickest way of getting it to the bottom—but I do not think that such an officer would have a chance of being appointed to a responsible position under the present Adastral regime.

However, the mere outside possibility of such a thing happening indicates the species of peril which besets the night-pilot. And, anyhow, the tale has an excellent moral—namely, that officers in charge of aerodromes should have a clear understanding with their pilots concerning all lights and their arrangement, and that nothing should be altered, except by hostile bombs, after the pilots have started.

THE DESTROYER'S JOB.

The actual job of attacking an airship in the dark, when once it is seen, does not appear to be any more perilous than attacking another well-armed aeroplane in daylight. The idea of a little lone aeroplane attacking the monster of the air naturally impresses the lay mind, but actually the case is rather analogous to a battle between a thresher shark and a whale than to a destroyer attack on a battleship. In the latter case the battleship carries heavy armour, so that the destroyer's guns cannot touch her, and the big guns of the ship should prevent any destroyer from ever getting within range, in daylight anyhow, so that the destroyer is only dangerous because of her torpedoes.

In the aircraft battle, in the first place, small black aeroplanes cannot be seen till they are fairly near the airship, and by that time they are close enough to bring their own guns to bear. If the airship looks for aeroplanes with searchlights it betrays its own presence to every aeroplane and gun for miles round. Also, an airship cannot be armoured against the fire of ordinary machine-guns, let alone against automatic guns of heavier calibre. And an airship cannot carry a heavier gun than a modern aeroplane can, so that it has no chance of booming off the aeroplane to a distance where it is out of range of the aeroplane's armament.

Added to that, an airship is a much easier target than an aeroplane, and is very much more vulnerable. For example, one can fill an aeroplane full of holes, so long as one does not hit the petrol tank, without doing it much harm, but one shot under ordinarily favourable conditions (modern conditions, of course, with the right projectile) is enough to spikebozzle the best airship.

And really, when one looks into the problem carefully, there does not seem much chance of the airship being able to develop any effective retaliatory frightfulness against attacking aeroplanes.

IMPROVED NIGHT-FLYING AEROPLANES.

On the other hand, there seems to be plenty of room for improvement in the night-flying aeroplanes. They certainly have a "performance," which is why they have been successful, but any aeroplane designer who could not improve them ought to go and make kite-balloons. Like other designs by the same firm, they seem to be a collection of bits stuck together, a sort of patchwork of afterthoughts. Or, as an old pilot said of another machine, "they have bits sticking out everywhere till they look like a map of Greece."

And there is nothing to brag about in their construction. I admit there was some provocation, but that engine never ought to have fallen out of its aeroplane when a certain officer was decanted into Dover Harbour. The story will be worth telling after the war, but meantime I beseech the A.I.D. to look carefully at the way those engines are put into the machines.

There should be little difficulty in obtaining vastly superior machines, specially designed for night-flying, if some of the firms which have shown originality in other directions were asked to produce designs. Some points to be desired in such machines are as follows:—

(a) Petrol capacity for a flight lasting from, say, 9 p.m. to dawn in the winter. No airship is likely to arrive much before that hour, and there should be no chance of a patrol machine being brought down by lack of petrol.

(b) Speed of at least 90 miles an hour at 10,000 feet altitude.

(c) Ability to drift down gently at less than 30 miles an hour, in the event of engine stoppage, and yet remain under elevator control, so that if collision with an obstacle cannot be avoided the machine can be stalled to a standstill before hitting it.

(d) Ability to jettison all or any portion of its petrol in a few seconds, so that it may increase its speed to pursue an enemy aircraft, or so that in case of engine stoppage it may descend as light as possible.

Such a machine could stagger off the ground heavily loaded with fuel for a long flight, and climb very slowly, time being no particular object on patrol. On sighting an enemy, it could jettison part of its load, and so climb and fly much faster. The petrol gauge would indicate the petrol in the tank by hours of flying, and not by gallons or fractions of the tank, so the pilot would know just how much to let out. And it would be so lightly loaded, when empty of fuel and armament, that it could hit an obstacle so slowly as to make certain of not hurting the pilot. And, incidentally, the ability to shed all the petrol before landing would absolutely abolish that ever-present horror of being burnt to death after quite a trivial smash.

SAFETY AGAINST FIRE.

There is, in fact, no reason why a device for emptying petrol tanks while making a forced descent should not be fitted to all existing machines. If such a gadget had been used in the past, a good many lives might have been saved.

I know pilots like to have their engines running when landing, but in a forced landing through an engine missing badly, or stopping altogether, it is better to be without petrol.

. The .

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Only recently I was told of two aviators being burnt to death in a way which should never be possible. They were flying a "pusher" biplane, and made a forced landing out in the country. In doing so they wiped off the under-carriage and apparently burst the petrol tank, so that they were soaked with petrol before they could climb out of the wreck.

Peasants running to see what had happened saw the two men get out and walk round the machine, apparently inspecting the damage. They stood beside it for a moment, and then there was a little burst of flame from the wreck. A second or two afterwards the whole thing was in a blaze; the clothes of the aviators caught fire, and when help arrived they were dead.

Now, such an accident could never happen if tanks could be emptied in a few seconds. Therefore the idea is well worth considering, especially for night-flying machines.

TO WHOM HONOUR IS DUE.

Everything possible should be done to lighten the task of the night-pilots. They themselves would be the last to claim that their work is any more difficult or dangerous than that of the pilots at the front, and no such claim is made for them. Only, they have done such notably good work of late, and have contributed so directly to the mental and bodily comfort of the people of England who sit at home at ease, by showing that it is possible to meet aerial invaders adequately, that one feels that no opportunity should be lost of suggesting improvements in their working conditions.

It is obvious that when sufficient night-patrols are available enemy airships dare not venture over British territory, and that then the greater part of the country can resume its normal method of lighting, so that night work in factories and night transport by road and rail can be kept in full swing, much to the advantage of Navy and Army alike.

Then we shall begin to realise how much we owe to the night-flying hornets. Already we owe them much for the good work they have done, but that is no reason for sitting still and saying that all is now well. Much more still remains to be done. Many more special machines are needed, and much better machines. Many more pilots are needed. The pilots must have what they want, not merely what the Government's official designers can give them, or would like to give them. I suggest that it would be worth the while of our best aeroplane designers and constructors to go into this question, and build machines better than any night-flying aeroplane now

existing. It is only the due of the men who are doing so much to preserve this country from invasion.

THE CATCH 'EM ALIVE O.

Finally, in lighter mood, let me give air to the brilliant idea of a young gentleman who is distressed that so many airships should be destroyed, instead of being caught alive. His notion is to produce an aeroplane which will capture Zeppelins without doing them much harm. He proposes a machine with an under-carriage fitted with barbed spikes, or grapnels, or the like. Such a machine would land on the back of the airship and cling there, and the weight of the aeroplane would bear the great beast to the ground. He omits to consider that the speed of the airship would be sufficient to make the aeroplane on top lift its own weight. But that could be got over by making the wings fold up, so that it would become a dead weight. There would probably be a pretty fight between the aeroplane crew and the gun-crew on the top of the airship, and it would be awkward if the grapnels pulled out and let the aeroplane fall off.

But, really, the idea is nothing like so silly as it sounds at first. It actually should be possible, with a little ingenuity, to produce some sort of grappling arrangement which would bring an airship down without setting it alight. Will some mechanical genius think it over?

And by the way! The Germans ought to be made clearly to understand that any skipper and crew of any airship which may be brought down in future, without being severely damaged, who destroy that ship after landing, will be very severely punished. As soon as that ship has landed, she becomes the property of the British Crown, and any German who destroys her should be subject to the same penalty as would be inflicted on a British subject if he destroyed a British airship, as distinct from the comfortable accommodation and courteous treatment accorded to a prisoner of war.

Both the R.N.A.S. and the R.F.C. have the greatest admiration for the courage and skill of the German airship crews, but the said crews must be made to understand that, when they have the luck to be brought down gently, they must play the game and surrender their matériel as well as themselves, if they want to be treated as worthy enemies afterwards.

Meantime, Good Luck to the night-pilots! May they live long and prosper exceedingly! And do not let us forget that the country owes something to the late First Lord of the Admiralty and the other Director of the Air Department for making the swarm of hybrid hornets possible.

C. G. G.

A VERY GALLANT GENTLEMAN.

A story which has appeared of late in various papers recounts in plain language one of the most tragic and heroic incidents of the war. Mr. Ridley's act is comparable with that of Captain Oates, who went out and died in a blizzard rather than be a drag on his companions, and, like Captain Oates, Mr. Ridley died heroically in vain. The story will live for ever in the history of the Royal Flying Corps.

The "Morning Post" publishes the tale in the following words:—

Recently the "Saturday Review" published some lines written by John Drinkwater in memory of "Riddles," a nickname by which Sec. Lt. Stewart Gordon Ridley was known in the R.F.C. This young officer landed in Egypt at the beginning of June of this year, and was soon sent down to an oasis in the Libyan Desert.

In the middle of the month he went out singly on a machine as escort to another pilot, who had with him a mechanic named J. A. Garside. The work they had to do was at a considerable distance, and a camel patrol had been sent out in advance to form a temporary landing place or station, from which they had to operate.

They left on Thursday afternoon, June 15th, and after flying an hour and a half—half an hour longer than they should—they failed to find the camel patrol. As it was getting dark they came down and encamped for the night. The following morning the weather was not very suitable, and Ridley, having the light machine, suggested that he should try to find the proper track of

the camel patrol. It was, however, found that his engine would not work. It had been giving him trouble the previous afternoon.

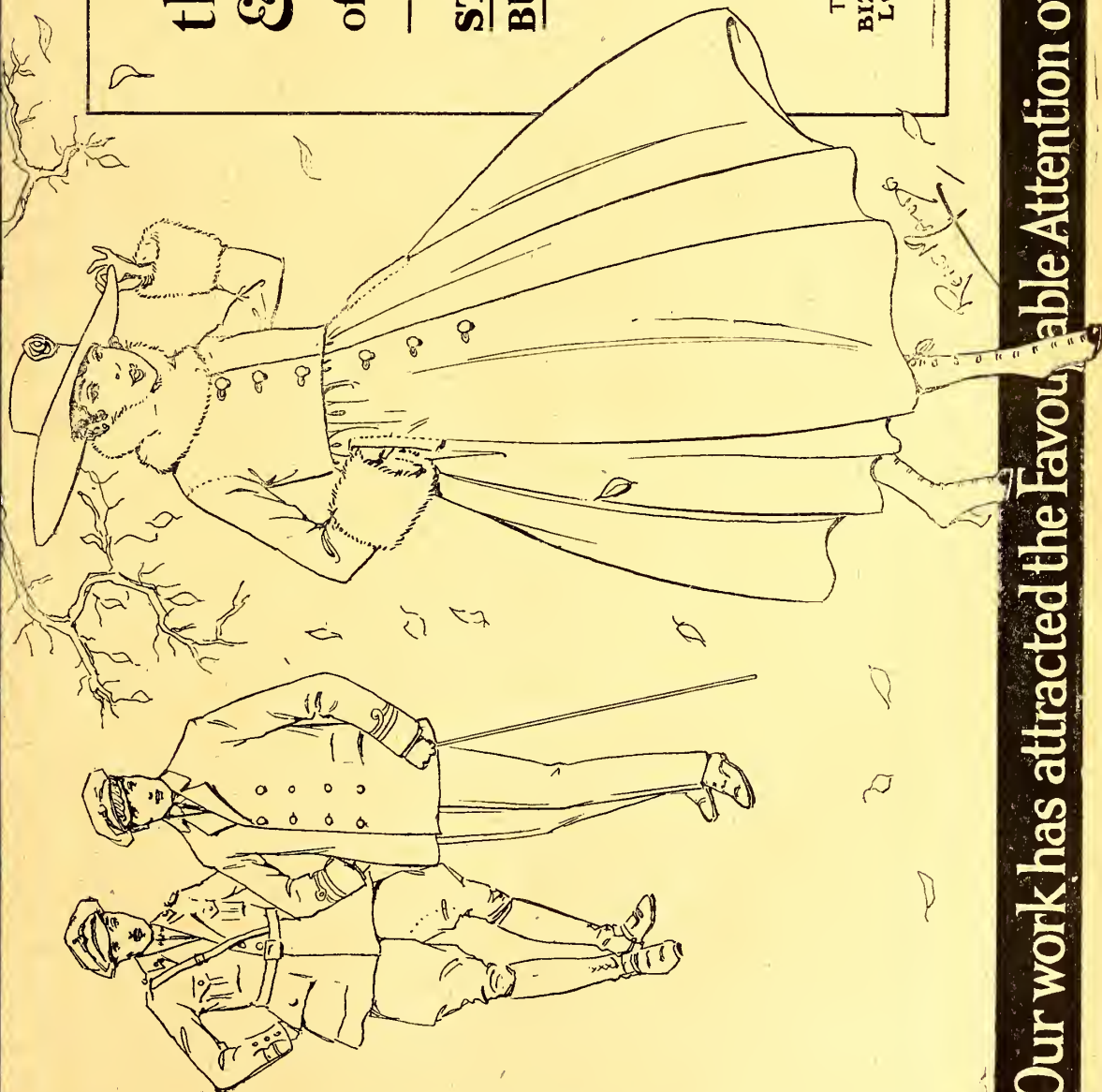
[One would like to have an official announcement concerning this engine, and why it failed.—Ed.]

The other pilot then decided that it was necessary that he should go back at once to the base (leaving his water and provisions), and find the exact position of the landing ground. He arranged that he should return on the following day (Saturday), and take Ridley and the mechanic (Garside) separately to the landing ground. He got back to the base, and found that, as the aviators had not turned up, the camel patrol had returned to the base. The pilot and the captain of the Camel Corps returned to the landing ground, and on the following morning (Saturday) the pilot began a search for the other two.

After some time he reached the place where he had left them, but the mechanic (Garside) and Ridley had gone. They left some odds and ends behind them, but no note. The pilot and his companion returned immediately to the base, and when it was ascertained that Ridley and Garside had not come back, search parties, consisting of camel patrols, motor cars, and aeroplanes, were at once sent out.

Nothing was discovered until the Sunday afternoon, when, 25 miles away from the spot where the first night had been spent, a second place was found. There the missing ones had landed, but they had again flown on after having patched up the machine. On the Tuesday afternoon the machine and two dead bodies were found by a motor party. During the search the pilot came across the footprints of two men walking. These were overtaken by a

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hostile camel patrol, and for a time it was thought and hoped that Ridley and Garside had been captured.

It was, however, found that Stewart Ridley shot himself at half-past ten on the Sunday night.

The captain of the Imperial Camel Corps said that from what he discovered he formed the opinion that Ridley had done this in the hope of saving the mechanic, and the commanding officer of the R.F.C. also states: "There is no doubt in my mind that he did this act of self-sacrifice in the hope of saving the other man."

After Ridley died Garside had kept a rough diary, of which the following is a copy:

"Friday.—Mr. Gardiner left for Meheriq and said he would come and pick one of us up. After he went we tried to get the machine going, and succeeded in flying for about 25 minutes. Engine then gave out. We tinkered engine up again, succeeded in flying about five miles next day (Saturday), but engine ran short of petrol.

"Sunday.—After trying to get engine started, but could not manage it owing to weakness, water running short—only half a bottle.—Mr. Ridley suggested walking up to the hills.

"Six p.m. (Sunday): Found it was farther than we thought; got there eventually; very done up. No luck. Walked back; hardly any water, about a spoonful.

"Mr. Ridley shot himself at 10.30 on Sunday whilst my back was turned. No water all day; don't know how to go on; got one Very light; dozed all day, feeling very weak; wish someone would come; cannot last much longer.

"Monday.—Thought of water in compass, got half bottle; seems to be some kind of spirit. Can last another day. Fired Lewis gun, about four rounds; shall fire my Very light to-night; last hope without machine comes. Could last days if had water."

A party with a chaplain went out on Sunday, June 25th, and buried the two in the desert, and erected a cross with their names on it over the heap of stones covering the bodies.

On his father's side Ridley came of a well-known Northumbrian family or clan, and the name of his residence, Willimoteswick, takes one back to that old fortified farmhouse in Northumberland where was born Bishop Ridley, who with Latimer at Oxford "played the man." His mother was born in Derry.

A WELL-DESERVED HONOUR.

It has already been announced briefly that the Cross of the Legion of Honour has been conferred on Sous-Lieutenant Louis Noël for his good services in the Balkans. The following account of his exploits, received from friends in Salonika, conveys more details than have appeared in the British Press.

The following citation was published in Army Orders:—

Sous-Lieutenant Louis Noël, engaged voluntarily for the duration of the war. Very old pilot, remarkable for his address, his bravery, his coolness, and his modesty. Has executed in France, as well as in the Orient, numerous difficult and perilous missions. Hardly convalescent from a grave operation, from the effects of which he was still suffering, he has just effected on two occasions the bombardment of an enemy capital, and has assured a long-distance link between two friendly armies, covering 1,100 kilometres [roughly 700 miles] there and back, of which 850 kilometres [over 500 miles] were over enemy territory.—(Signed) SARRAIL.

Such a citation over the name of General Sarrail, coming after his previous mentions in Army Orders, when he won his Médaille Militaire, and his Croix de Guerre with its numerous "palmes," and the Russian Cross of St. George, stamps our old friend as one of the most heroic of the pilots of our gallant French allies.

The famous flight from Salonika to Bukarest is described in a Roumanian journal, "L'Indépendance Roumaine" (Sept. 16th):

"Roumania received yesterday the visit of gracious allied winged guests, who come to us from Salonique, from the heroic army of Sarrail, from that corner of ground which, right in the heart of the Balkans, sinks in like a vice, to choke in its powerful grip the vile Bulgars and our common enemies.

"As legitimate reprisal for the cowardly attack on Bukarest by the Zeppelins, the French aviators had received orders to bombard Sofia and reach Roumania afterwards.

"Yesterday, Wednesday, at 6.20 a.m., four French avions left Salonique.

"The first, a Farman biplane (F.40), 140 h.p., conducted by the heroic Sous-Lieutenant Noël, one of the best aviators of the French Army, who had already sunk two German avions in the course of 17 months passed on the German front. The Sous-Lieutenant Noël brought with him Lieutenant Leseur, one of the best observers of the Army of Salonique.

"The second biplane—also an F.40—was mounted by Sergeant Lamprou and the soldier-machine-gunner Masson. The third—a Nieuport 80 h.p.—by the Lieutenant Quillery and an observer; and the fourth—again an F.40—by the Sergeant Rohan and a machine-gunner.

"At 8.40 the Noël biplane arrived above Sofia, where were to be seen several fires lighted by one of the French avions which had just passed. The Lieutenant Leseur let go many bombs, of which one fell at less than 60 mètres from the Royal Palace. Another bomb set light, full in the centre of the town, to a house of many stories, which crumpled up almost instantly.



CROSSING THE DANUBE.—The first pilot to reach Bukarest, photographed by his observer just as they crossed the Danube. The great river is seen in the left lower corner. The pilot's smile seems somewhat frozen.

"The aviators were perfectly guided by the sparkling dome of the cathedral. Let us say that the bombs thrown contained an explosive newly discovered by the French, and of an extraordinary power of destruction.

"Some German avions made chase to the French avions, which were soon able to distance them without being touched by their projectiles.

"At 11.20 a.m. the avion piloted by the Sous-Lieutenant Noël arrived at Bukarest, where he descended directly in the aviation field, in the midst of the delirious acclamation of the Roumanian aviators. The biplane Lamprou descended at Alexandria, and the two others landed, according to orders, at Turnu-Magaurele.

"Six hundred kilometres in a single stage! A hundred and twenty kilometres to the hour! The difficult crossing of the Balkans, with their heights of over 2,900 metres [9,000 feet], their pernicious currents, their thousand and one difficulties, effected without encumbrance, without the least accident! What marvelous exploit of hability, of cool blood, of this legendary and magnificent heroism French! What new and beautiful page of glory to inscribe to the credit of the aviation French! Salutes to you, glorious heroes of the air! Salutes to you, well-beloved colours of France, which in these solemn hours come to unite yourselves to the tricolor Roumanian! Roumania has received you open armed with legitimate pride, and from the plains of the Danube up to the slopes of the Carpathians, and from the banks of the Olt and of the Muresh, and from those of the Black Sea, to those of the Thass, a sole cry sincere, but which sums up all our sentiments, will hail you, 'Vive la France! Vive l'armée française!!'"

Not a bad effort at lyric ecstasies that. One wishes one could be similarly ecstatic in English without appearing ridiculous. However, the aviators thoroughly deserved all the acclamation.

All the French pilots remained in Roumania except Louis Noël, who flew back alone on the 19th, again without landing, and calling at Sofia on the way. Owing to a head wind after reaching the seaward side of the Balkans, he only just scraped home without a drop of "essence."

A friend in Salonika sends a couple of photographs taken by Lieut. Leseur on the journey. One shows the pilot at close quarters, just as the machine was crossing the Danube into Roumania, the smile appears somewhat frozen, but it is a good effort. Another photograph shows the machine immediately after its arrival at the Beresca aerodrome.

Our friend tells an amusing incident of how Louis Noël on one of his trans-Balkan trips was flying close along the side of a mountain at 8,500 feet, when to his surprise he saw a shepherd with about 100 sheep on the hill-side, at about his own level. He waved his hand in a friendly way to the shepherd, and seemed quite hurt because the shepherd leant immobile on his staff and looked at him as if he were saying (as the aviator put it when relating the story), "Who is this great devil who comes to disturb my solitude?"

The Sous-Lieutenant Noël is about due for some leave. One hopes he may get it and may return to England. Might one therefore suggest that as he is quite the most decorated and distinguished of the Hendon aviators, his friends there might organise some sort of semi-public function in his honour?—C. G. G.

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From the "London Gazette," Oct. 3rd, 1916.

ADMIRALTY, Sept. 30th.

R.N.A.S.—Temp. Proby. Flt. Sub-Lts. to be temp. Flt. Sub-Lts.: Arthur R. Brown, Nov. 15th, 1915. Arnold J. Chadwick, Dec. 30th, 1915. William H. Chisham, Jan. 3rd, 1916. Robert A. Campbell, Jan. 10th, 1916. Wallace E. Orchard, Jan. 18th, 1916. William N. R. Brown, Jan. 23rd, 1916. Daniel F. Ellis, Jan. 29th, 1916. Ellis Anthony, David M. Ballantyne, Feb. 3rd, 1916. Morris Faux, Feb. 11th, 1916. Thomas C. Wilkinson, Charles McNicoll, Feb. 12th, 1916. John E. A. Hoare, Feb. 18th, 1916. Victor R. Scriven, Charles L. Bailey, Feb. 29th, 1916. Lacey N. Glaisby, Apr. 3rd, 1916. George E. Johnson, Apr. 17th, 1916. Harold Drummond, May 9th, 1916. Thomas P. M. Alexander, May 14th, 1916. George C. B. Cotterell, May 21st, 1916. Edward G. Hopcraft, May 22nd, 1916. Edwin S. Goodwin, Cyril W. Cory-Wright, May 28th, 1916. Arthur C. Corbett, June 11th, 1916. William J. de Salis, June 18th, 1916. Norman von L. Tapscott, Cyril B. Ridley, June 25th, 1916. Edward E. Maitland Heriot, July 1st, 1916.

Oct. 1st.

The following Flt. Sub-Lts. have this day been promoted to the rank of Flt. Lt.:—R. Souray, C. V. Arnold, L. H. Wilkins, R. Young, R. M. Clifford, W. L. Graham, J. C. Croft, Hon. N. G. H. Sturt, T. P. Y. Moore, P. E. Maitland, P. G. N. Ommanney, W. Underhill, C. W. C. Browne, C. B. C. Swayne, A. H. Wann, T. W. Elmhurst, W. P. C. Chambers, I. C. Little, C. C. R. Edwards, D. Gill, H. McClelland, W. R. Mackenzie.

The following temp. Flt. Sub-Lts. have this day been promoted to temp. Flt. Lts.:—C. C. Carlisle, O. A. Butcher, H. E. Crawford, J. E. D. Boyd, W. H. Sharpe, B. E. P. Gregg, R. W. Lane, A. E. Hawker, I. H. W. Barnato, S. O. Smith, L. A. T. Pritchard, G. A. Gooderham, S. J. Goble, G. Preen, C. A. Rea, C. A. Eyre, F. S. McGill, F. E. Sandford, F. N. Halsted, N. Keeble, A. A. Wallis, F. D. H. Bremner, M. Bartlett, C. W. Jamieson, W. M. Tait, G. E. Hervey, M. R. Buckland, R. S. de Q. Quincy, H. G. Travers.

WAR OFFICE, Oct. 3rd.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdr.—Temp. Lt. J. F. Johnson, Gen. List, from a Balloon Officer, and to be temp. Capt. while so empld., Sept. 13th.

Equipment Officer.—Temp. Sec. Lt. E. L. Taylor, Gen. List, from an Asst. Equipment Officer, and to be temp. Capt. while so empld., August 1st.

Flying Officers.—Sec. Lt. J. F. A. Day, S.R., Aug. 17th. Temp. Sec. Lt. J. L. Trollope, Gen. List, Sept. 2nd. Sec. Lt. A. B. Drewry, S.R., Sept. 4th. Capt. H. A. Hill, I.A., temp. Capt. G. Taylor-Loban, Durh. L.I., and to be transf. to Gen. List, temp. Sec. Lt. W. G. Nicholls, E. Surr. R., and to be transf. to Gen. List, Sec. Lt. V. R. Stewart, A.S.C., Sept. 5th. Temp. Sec. Lt. J. P. Alexander, R. Scots, and to be transf. to Gen. List, Sec. Lt. H. D. Crompton, W. Lan. Brig., R.F.A., T.F., temp. Sec. Lt. R. T. Barlow, Gen. List, Sec. Lt. P. G. Robinson, S.R., Sept. 6th. Sec. Lt. G. Barrett, S.R., Sept. 7th.

Flying Officers (Observers) who have graduated as Pilots, and been apptd. Flying Officers in previous "Gazettes," will take their place on the list of Flying Officers, with effect from the date of their appt. as Flying Officers (Observers).

Flying Officers (Observers).—Lt. N. W. Stewart, 7th R. Scots, T.F., Sec. Lt. E. King, 3rd K.O. Sco. Bord., S.R., and to be sec'd., April 5th. Temp. Capt. W. H. de W. Waller, A.S.C., and to be transf. to Gen. List, temp. Lt. H. J. Duncan, R.A., and to be transf. to Gen. List, Sec. Lt. G. E. Godsave, Lond. R., T.F., temp. Sec. Lt. E. V. Pemberton, R.A., and to be transf. to Gen. List, Sept. 9th. Sec. Lt. (temp. Lt.) R. Speirs, Sco. Rif., T.F., Sec. Lt. (temp. Lt.) C. S. Workman, Sco. Rif., T.F., temp. Lt. R. S. S. Ingram, W. Rid. R., and to be transf. to Gen. List, temp. Sec. Lt. C. Street, Ches. R., and to be transf. to Gen. List, Sept. 11th. Sec. Lt. R. G. R. Allen, W. York R., T.F.; temp. Sec. Lt. R. Stephenson, Army Cyclist Corps, and to be transf. to Gen. List; temp. Sec. Lt. G. H. Wood, Gen. List, Sept. 16th.

Asst. Equipment Officer.—Temp. Sec. Lt. E. E. Castle, Gen. List, April 30th.

INFANTRY.—K.R.R.C.—Lt. to be Capt.:—E. F. Campbell, April 30th, and to be sec'd. from July 10th for service with R.F.C.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) resign their commns.:—A. G. Stewart, J. J. Dunne, W. L. Winstanley, Oct. 4th.

Sec. Lt. (on prob.) G. L. Main is confirmed in his rank.

To be Sec. Lts. (on prob.):—W. F. J. Matthews, Aug. 24th. F. Jewell, S. F. Feast, J. H. G. Wilson, T. M. Wilson, H. I. Allen, C. E. Oxendale, S. S. Kaye, R. Berl, D. A. Pearson, L. B. Crough, Sept. 3rd. R. G. Watts, Sept. 4th.

TERRITORIAL FORCE.—INFANTRY.—SHROPS. L.I.—Sec. Lt. A. Rice-Oxley is sec'd. for duty with R.F.C., Sept. 10th.

SOUTH LANCASHIRE REGT.—Sec. Lt. (temp. Lt.) R. C. Kean is sec'd. for duty with the R.F.C., Aug. 29th, 1916.

NORFOLK REGT.—Sec. Lt. R. B. C. M. T. de Poix is sec'd. for duty with R.F.C., Aug. 9th.

From the "London Gazette" Supplement, Oct. 4th, 1916

WAR OFFICE, Oct. 4th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Experimental Officer (graded as an Equipment Officer).—Capt. R. B. Bourdillon, Spec. Res., from a Flying Officer, June 9th (substituted for notification in "Gazette" of Sept. 13th).

Flying Officers.—Sec. Lt. (temp. Lt.) W. E. Grosset, Highland Cyclist Bn., T.F.; Sec. Lt. (on prob.) E. A. McKay, Spec. Res., June 21st. Maj. E. H. M. O'Farrell, R. Ir. Fus., from a Flying Officer (Observer), June 28th, seny. from Oct. 21st, 1915. Temp. Sec. Lt. J. L. Tibbetts, Gen. List, Sept. 7th. Temp. Sec. Lt. G. H. Raitt, Gen. List, Sept. 9th. Sec. Lt. A. Rice-Oxley, Shrops. L.I., T.F., Sec. Lt. J. P. C. Mitchell, High. L.I., S.R., and to be sec'd., Sec. Lt. (on prob.) T. Hayes, S.R., Sept. 10th. Temp. Sec. Lt. N. R. Pomeroy, Gen. List, Sept. 11th. Sec. Lt. G. J. H. Lascelles, S. Mid. (Glouc.) Brig., R.F.A., T.F., Sec. Lt. W. S. Caster, Hunts Cyclist Bn., T.F., from a Flying Officer (Observer), seny. from April 1st, temp. Sec. Lt. A. J. Fisher, Gen. List, temp. Sec. Lt. L. B. Solomon, Gen. List, Sept. 12th. Sec. Lt. (on prob.) H. S. Lees-Smith, S.R., Sept. 13th. Sec. Lt. (on prob.) J. S. Mitchell, S.R., Sept. 14th.

MEMORANDA.—1st Class Air Mechanic H. S. Wilkins, from R.F.C., to be temp. Sec. Lt. for duty with the Mil. Wing of that Corps, Aug. 4th.

To be temp. Sec. Lts. for duty with R.F.C.:—Chief Petty Officer J. L. Greener, from R.N.V.R., Pte. F. B. Stevens, from 1st Suss. Yeo., T.F., Sept. 1st. Pte. W. E. Wright, from Inns of Court O.T.C., Sept. 9th.

* * *

From the "London Gazette" Supplement, Oct. 5th, 1916.

WAR OFFICE, Oct. 5th.

REGULAR FORCES.—STAFF.—TEMPORARY APPOINTMENT AT WAR OFFICE.—Staff Capt.—Maj. D. H. Cameron, ret. pay, Ind. Army, vice temp. Capt. the Hon. E. E. Charteris, Sept. 19th, 1916.

ESTABLISHMENTS.—R.F.C.—Squadron Comdr.—Capt. H. Wyllie, Wilts R., from a Flt. Comdr., to be sec'd., and to be temp. Maj. whilst so empld., Sept. 1st (substituted for the notification in the "Gazette" of Sept. 25th).

Park Comdr.—Temp. Capt. F. W. K. Davies, A.S.C., to be transf. to Gen. List, and to be temp. Maj. whilst so empld., Sept. 20th.

Flight Comdr.—Sec. Lt. (on prob.) R. J. Hudson, R. Fus., Spec. Res., from a Flying Officer, and to be temp. Capt. whilst so empld., Aug. 9th.

Flying Officers.—Sec. Lt. (on prob.) W. S. Frackleton, Spec. Res., Aug. 30th. Sec. Lt. (on prob.) W. T. B. Tasker, Spec. Res., Sept. 3rd. Temp. Sec. Lt. W. J. Stonier, Bedf. R., Sept. 5th. Lt. J. C. F. Owen, Canadian A.S.C., Sept. 6th. Sec. Lt. P. F. Heppell, Northumbrian Brig., R.F.A., T.F.; Sec. Lt. H. J. Finer, Home Counties Divl., R.E., T.F.; Sec. Lt. (on prob.) M. J. Fenwick, Spec. Res.; temp. Sec. Lt. V. B. Allen, Gen. List; temp. Sec. Lt. G. H. Cock, Gen. List; temp. Sec. Lt. C. E. Ward, Gen. List, Sept. 7th. Temp. Sec. Lt. O. J. Wade, R. W. Kent R., and to be transf. to the Gen. List; Sec. Lt. (on prob.) G. H. Lee, Spec. Res., Sept. 11th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—MIL. WING.—Sec. Lt. (on prob.) W. H. Douche resigns his commn., Oct. 6th.

The following Sec. Lts. (on prob.) are confirmed in rank:—F. H. Gay, B. James, R. W. Cross, R. G. Fordham, G. W. Dampier, W. M. Kent, N. B. Lovemore, T. A. B. Rolfe, G. H. Foley. To be Sec. Lts. (on prob.):—A. L. Challis, Aug. 22nd. E. M. Leete, R. M. Ward, Aug. 27th. L. Davies, J. W. Parkinson, Aug. 31st. L. M. van Eyssen, Sept. 1st. H. Fuller-Clark, Sept. 3rd. G. W. Longstaff, Sept. 10th. J. R. Taverner, Sept. 18th. R. L. Lyster-Smythe, Sept. 25th.

TERRITORIAL FORCE.—YEOMANRY.—HERTFORDSHIRE.—Lt. (temp. Capt.) A. A. Nathan is now sec'd. for duty with the R.F.C., July 12th.

R.F.A.—W. RID. BRIG.—Sec. Lt. E. Elgey is sec'd. for duty with the R.F.C., Sept. 18th.

INFANTRY.—W. YORKS R.—Sec. Lt. R. G. R. Allen is sec'd. for duty with the R.F.C., Sept. 16th.

SCOT. RIF.—Sec. Lt. (temp. Lt.) C. S. Workman is sec'd. for duty with the R.F.C.; Sec. Lt. (temp. Lt.) R. Speirs is sec'd. for duty with the R.F.C., Sept. 11th.

LONDON R.—G. E. Godsave is sec'd. for duty with the R.F.C., Sept. 9th. Sec. Lt. E. B. Harvey is sec'd. for duty with the R.F.C., March 3rd. Sec. Lt. E. B. Harvey is granted the temp. rank of Lt. whilst empld. with R.F.C., June 1st.

R. WAR. R.—Sec. Lt. A. N. Greg is granted the temp. rank of Lt. while empld. with R.F.C., July 1st.

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From the "London Gazette," Oct. 6th, 1916.

WAR OFFICE, Oct. 6th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Equipment Officer.—Rank of Sec. Lt. E. L. Taylor, Gen. List, is as now described, and not as in the "Gazette" of Oct. 3rd.

Experimental Officer.—(Graded as an Equipment Officer).—The date of appt. of Lt. (temp. Capt.) B. M. Jones, R.E., T.F., is June 9th, and not as in the "Gazette" of Sept. 13th.

Flying Officers.—Sec. Lt. (on prob.) E. R. Yates, Spec. Res.; Sec. Lt. (on prob.) E. D. Spicer, Spec. Res., July 3rd. Sec. Lt. H. A. Hallam, York and Lanc. R., Spec. Res., and to be sec'd.; Sept. 13th. Temp. Lt. N. W. Wickham, R. Lanc. R., and to be transf'd. to Gen. List; temp. Sec. Lt. H. R. Davies, R.E., Spec. Res.; Sec. Lt. H. W. Girdlestone, R.A., and to be sec'd.; Sec. Lt. G. H. Foley, Spec. Res.; Sec. Lt. (on prob.) W. D. Thom, Spec. Res., Sept. 14th. Capt. D. V. J. Blake, Australian Flying Corps; Sec. Lt. (on prob.) J. V. A. Gleed, Spec. Res.; Sec. Lt. R. W. Cross, Spec. Res., Sept. 15th. Capt. H. J. Segrave, Wilts R., and to remain sec'd.; Sec. Lt. R. G. Fordham, Spec. Res., Sept. 16th. Sec. Lt. (temp. Lt.) A. H. Orlebar, Beds. R., T.F., Sept. 17th. The appt. of temp. Sec. Lt. P. W. M. Orme, notified in the "Gazette" of Aug. 24th, is antedated to June 18th.

Asst. Equipment Officers.—Sec. Lt. E. J. Street, Sec. Lt. H. Jones, Sec. Lt. J. H. Winch, July 10th (subst. for notification in "Gazette" of Aug. 8th). Sec. Lt. W. Park, Spec. Res., Sept. 4th.

MEMORANDUM.—Sec. Lt. (on prob.) A. Roberts, from R.F.C., Spec. Res., to be temp. Sec. Lt. on Gen. List, for duty with R.F.C., Aug. 15th.

SPECIAL RESERVE OF OFFICERS. — SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The appt. of Sec. Lt. (on prob.) L. F. Bennett, notified in "Gazette" of July 27th, is antedated to June 21st.

The following Sec. Lts. (on prob.) are confirmed in their rank: M. J. Fenwick, W. S. Frackleton, J. S. Mitchell, G. H. Lee, W. T. B. Tasker, C. E. Blayney, S. W. Taylor, C. H. Vincent, J. D. Stodart, H. Thompson, F. H. Sanders, F. G. Seabrooke, R. T. Vernon, T. Hayes, C. J. Pender, A. J. McWha, H. B. Burrell, C. Elphinstone, H. J. Whittingham, P. Young.

W. Park to be Sec. Lt., Sept. 4th. To be Sec. Lts. (on prob.): W. P. Bingham, Sept. 1st. F. H. Postlethwaite, Sept. 9th.

TERRITORIAL FORCE. — R.G.A.—CORNWALL.—Sec. Lt. (temp. Capt.) R. H. Mudge is sec'd. for duty with the Anti-Aircraft Co., Sept. 28th.

DURHAM.—Sec. Lt. (temp. Lt.) J. S. Dowson is sec'd. for duty with Anti-Aircraft Depot, June 20th.

GLAMORGAN.—Officers sec'd. for duty with the Anti-Aircraft Depot:—Sec. Lts. R. G. Jones, G. H. Noel, H. O. Jones, June 15th.

LANC. AND CHES.—Officers sec'd. for duty with the Anti-Aircraft Co.:—Sec. Lts. (temp. Lts.) P. W. Williams, R. H. Belem, J. P. Postlethwaite, Jan. 6th.

2ND LOND.—Capt. T. H. Grice is sec'd. for duty with Anti-Aircraft Depot, June 15th.

PEMBROKE.—Officers sec'd. for duty with Anti-Aircraft Depot:—Sec. Lt. A. H. Evans, Sept. 20th. Sec. Lt. W. F. James, June 16th.

TYNEMOUTH.—Capt. S. M. Todd is sec'd. for duty with the Anti-Aircraft Depot, June 20th.

INFANTRY.—S. STAFFS. R.—Lt. F. Wilkinson is sec'd. for duty with the R.F.C., Sept. 23rd.

* * *

From the "London Gazette" Supplement, Oct. 7th, 1916.

WAR OFFICE, Oct. 7th.

REGULAR FORCES.—The undermentioned Wt. and N.C.Os. to be Sec. Lts. for Service in the Field:—

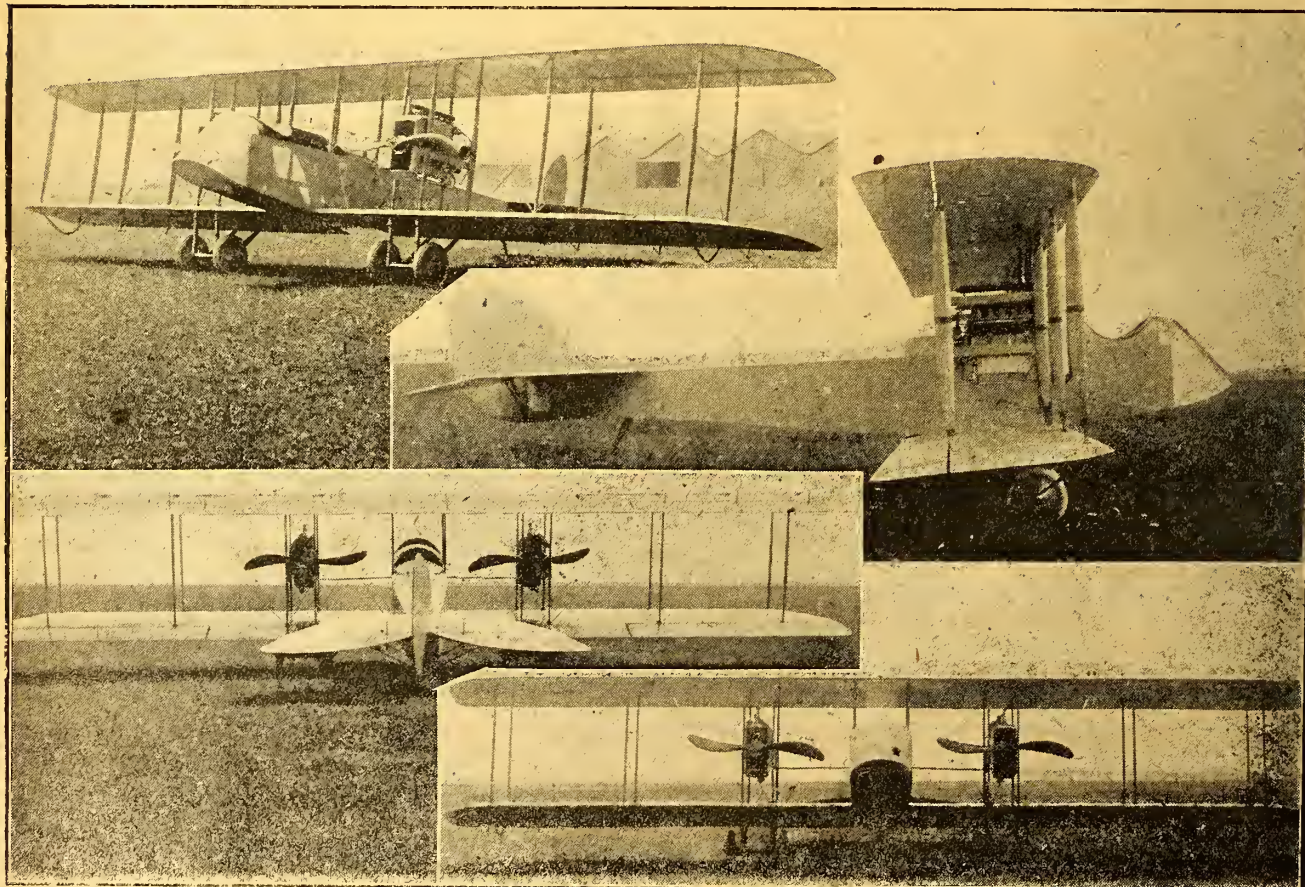
MEMORANDA.—For duty with R.F.C.—Pte. J. Phillips, from A.S.C., Aug. 31st. Sgt. W. J. Reid, from A.S.C., Cpl. C. H. Blakeway, from R.F.C., Sept. 3rd. Pte. J. H. McLellan, from Can. Inf., Sept. 6th. Cpl. C. E. Wilson, from Lond. R., Sept. 7th.

ESTABLISHMENTS.—R.F.C.—Flight Comdr.—Capt. G. Disney, Essex R., Sept. 25th, sen. from June 1st.

Flying Officers.—Sec. Lt. C. R. Keary, N. Staff R., and to be sec'd., Sept. 15th. Temp. Sec. Lt. (temp. Lt.) J. L. M. de C. Hughes-Chamberlain, Gen. List, from a Flying Officer (Observer), sen. from May 6th. Temp. Sec. Lt. N. F. W. Rockey, Gen. List, Temp. Sec. Lt. A. Denison, R. W. Surr. R., and to be transf'd. to Gen. List, Sec. Lt. W. A. M. Niven, Spec. Res., Sept. 16th. Lt. F. V. Woodman, Canadian Gen. List, from a Flying Officer (Observer), sen. from April 1st. Sec. Lt. R. S. Larkin, Spec. Res., Sept. 17th. Sec. Lt. F. H. Gay, Spec. Res., Sept. 18th.

Asst. Equipment Officers.—Sec. Lts., Spec. Res.:—R. J. Cowan, C. H. Boyle, R. A. Hassard, temp. Sec. Lt. L. H. Aston, Gen. List, Sept. 4th.

KITE BALLOON SCH. OF INSTN.—Commandant.—(Graded as a



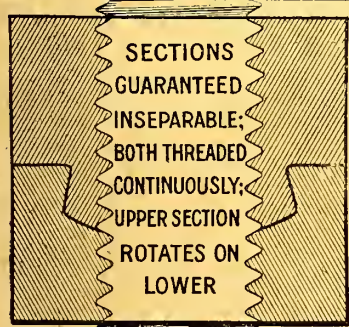
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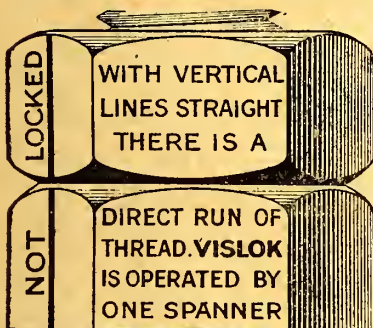
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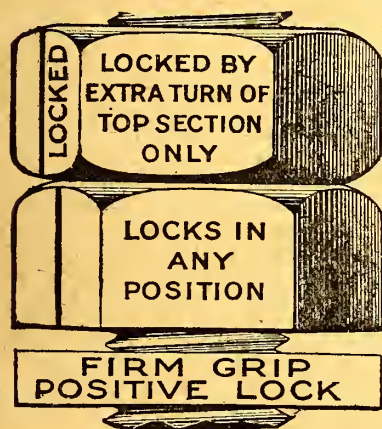


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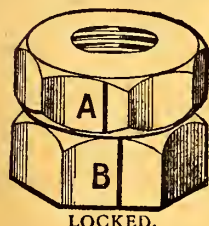


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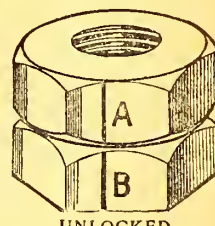


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Sqdn. Comdr.).—Temp. Capt. A. H. Parker, Gen. List, from a Flt. Comdr., vice Capt. G. Disney, Essex R., Sept. 25th.

INFANTRY.—DEVON R.—Capt. W. J. Alexander is sec'd. for service with R.F.C., Sept. 11th.

MEMORANDA.—To be temp. Sec. Lts. for duty with R.F.C.:—Chief Petty Officer L. H. Aston, from R.N.A.S., Aug. 7th. Staff-Sgt. F. Green, from New Zealand Expeditionary Force, Sept. 25th. To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Lce.-Cpl. G. M. J. Denman, from R. Suss. R., T.F., Aug. 28th. Lce.-Cpl. J. Wingate, from Herts Yeo., T.F., Aug. 31st. Pte. D. M. Mackie, from Inns of Court O.T.C., Sept. 11th. Pte. B. O. Butler, from Canadian A.S.C.; Regtl. Qrmr.-Sgt. E. H. Hooper, from 3rd Co. of Lond. Yeo., T.F.; Sgt. A. L. Johnson, from Lond. Electrical Engrs., R.E., T.F., Sept. 24th.

The following, from R.F.C., to be temp. Sec. Lts. (on prob.) for duty with the Mil. Wing of that Corps:—Flt. Sgt. H. Dear, Sept. 24th. 1st Cl. Air Mech. W. G. Ruggins, Oct. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) W. S. Roberts is dismissed the Service by sentence of a General Court Martial, Sept. 16th. The following Sec. Lts. (on prob.) are confirmed in their rank:—G. L. Rodwell, W. A. M. Niven, R. S. Larkin, J. E. Histed, N. E. S. Simon, W. D. Thom. J. V. A. Gleed, P. H. Smith, N. H. Read, H. E. Martin, E. D. Spicer, J. R. Hembrough.

To be Sec. Lts. (on prob.):—H. J. Taplin, Aug. 17th. A. D. Robertson, Aug. 27th. H. E. Jarman and H. B. D. Grazebrook, Sept. 24th.

* * *

From the "London Gazette" Supplement, Oct. 9th, 1916.

WAR OFFICE, Oct. 9th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers.—Sept. 13th, 1916: Lt. G. C. Rogers, Canadian Gen. List; Lt. R. G. Macnaughton, R. Highrs., T.F., from a Flying Officer (Observer), with seniority from May 26th, 1916; Sec. Lt. (on prob.) J. H. Broadway, Dorset R., Spec. Res., and to be sec'd. Sept. 15th, 1916: temp. Sec. Lt. D. E. Hood, Bedf. R., and to be transf'd. to Gen. List; temp. Sec. Lt. G. R. A. Deacon, R. Suss. R., and to be transf'd. to Gen. List; Sec. Lt. E. A. Clark, Spec. Res. Temp. Sec. Lt. J. H. O. Jones, Gen. List. Sept. 16th, 1916. Sec. Lt. J. E. Histed, Spec. Res. Sept. 17th, 1916. Sept. 18th, 1916: Temp. Lt. L. Dodson, S. Staff. R., and to be transf'd. to Gen. List; Sec. Lt. C. L. Roberts, S. Lan. R., Spec. Res., and to be sec'd.; Sec. Lt. E. Elgey, W. Rid. Brig., R.F.A., T.F.; Sec. Lt. H. E. Martin, Spec. Res.

WORKS BATTALIONS.—GEN. LIST.—Cds. to be temp. Sec. Lts. (on prob.), for duty with R.F.C.:—H. R. Evans, J. A. Dales, Aug. 5th.

MEMORANDA.—The undermentioned to be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Sergt. Alfred Leonard Pearce, from 1st Mounted Divl. Sigl. Sqdn., R.E., T.F. Sept. 11th, 1916. Corpl. Richard Cotton Carline, from a Training Res. Bn., Middx. R. Sept. 16th, 1916. Corpl. Francis Joseph Cunningham, from Canadian Red Cross Hosp. Sept. 17th, 1916. Sept. 24th, 1916: Lce.-Corpl. Herbert Newsn, from A.S.C.; Lce.-Corpl. Charles Henry Stafford, from Berks. Yeo., T.F. Pte. George Gordon Onions, from A.S.C., Sept. 30th, 1916.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The undermentioned Sec. Lts. (on prob.) are confirmed in their rank: E. A. Clark, M. A. Chappell, T. G. Mackenzie, A. C. Hartley, R. P. C. Freemantle, F. E. Hobley, D. W. Wilson, H. G. Welsford, A. W. Payne, F. M. Howard, D. Smith, E. E. Glorney, L. G. Poole-Warren, J. N. Stephens. The under-mentioned to be Sec. Lts. (on prob.). Aug. 31st, 1916: Alfred Ernest Biggs, Alfred William Barlow. Henry John Griffin Dyer. Sept. 10th, 1916. Sept. 17th, 1916: Charles Henry Stevens, Armstrong Graham. Sept. 18th, 1916: Richard Norman Vyvyan, Hubert Challen Sharp. Beryl Vernour Noel Rowcroft. Sept. 21st, 1916. Sept. 30th, 1916: Robert George Whitcombe, George Elson Quincey, Walter Douglas Scott.

TERRITORIAL FORCE.—R.G.A.—TYNEMOUTH.—The undermentioned officers are seconded for duty with the Anti-Aircraft Co. Oct. 10th, 1916: Lt. (temp. Capt.) W. L. l'Anson-Robson. Sec. Lt. (temp. Lt.) T. A. H. Rowsell, Sec. Lt. (temp. Lt.) W. D. R. Jackson, Sec. Lt. F. D. Young, Sec. Lt. K. J. Reader, Sec. Lt. T. A. Swallow.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Oct. 7th.

The following Officers had the honour of being received by the King, when His Majesty invested them with the Insignia of Companions of the Orders into which they have been admitted:—

THE DISTINGUISHED SERVICE ORDER.

Sqdn. Comdr. REGINALD BONE, R.N.
Flt. Comdr. REDFORD MULOCK, R.N.
Lt. MALCOLM HENDERSON, R.F.C.
Sec. Lt. ALFRED DE BATH BRANDON, R.F.C.
Sec. Lt. FREDERICK SOWREY, Royal Fusiliers, attd. R.F.C.

The King then conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.

Sqdn. Comdr. FRANCIS HASKINS, R.N.
Flt. Comdr. DOUGLAS EVILL, R.N.
Flt. Comdr. VINCENT NICHOLL, R.N.
Flt. Lt. JOHN PETRE, R.N.
Flt. Lt. RODERIC DALLAS, R.N.
Flt. Lt. RALPH COLLET, R.N.

THE MILITARY CROSS.

Lt.-Col. WILFRED FREEMAN, R.F.C.
Maj. LORD GEORGE WELLESLEY, R.F.C.
Capt. JAMES JACKSON, R.F.C.
Capt. CUTHBERT ROWDEN, R.F.C.
Capt. JAMES BUSH, Dorsetshire Regt., attd. R.F.C.
Lt. HERBERT ELLIS, R.F.C.
Sec. Lt. WILLIAM BOND, King's Own (Yorkshire Light Infantry), attd. R.F.C.
Sec. Lt. ALFRED BRANDON, R.F.C.
Sgt.-Maj. JOHN PELL, R.F.C.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Oct. 4th.—The following have been entered as Proby. Flt. Officers (temp.), seny. Oct. 8th:—Petty Officers (Mechanics) W. G. Parry and T. H. Levett; Air Mechanic (1st grade) A. R. Willmott, Leading Mechanic D. R. Douglas, W. F. Dickson, G. A. Edwards, J. P. Everitt, E. S. Dean, R. V. Britwell, and P. C. Richards.

Mr. V. Read entered as Warrant Officer, 2nd grade (temp.), seny. Oct. 9th.

Oct. 5th.—Messrs. J. H. W. Clarke and E. Mc. D. Wright, both entered as Proby. Flt. Officers (temp.), seny. respectively Oct. 8th and 15th, and apptd. to "President," for R.N.A.S.

Temp. Sub-Lt. (R.N.V.R.).—C. B. Orfeur, to "President," for R.N.A.S., Oct. 8th.

Oct. 7th.—Asst. Payr. (R.N.R.).—F. H. Wakeford, entered as Prob. Flt. Officer (temp.), seny. Oct. 6th.

Oct. 10th.—The following temp. Lts., R.N.V.R., promoted to temp. Lt.-Comdr., R.N.V.R., all with seniority, Oct. 5th:—L. H. Strain, D.S.C., H. Ingram, C. F. Steele, B. O. Jenkins, W. Park, D.S.C., C. F. Jenkin, C. Kirby, W. A. Briston, F. W. Hodges, and F. S. Pilling.

Messrs. G. H. Childs, P. Swain, and A. J. Dronsfield granted temp. commissions as Lt., R.N.V.R., and appointed to the "President," for R.N.A.S., to date Oct. 7th.

The undermentioned temp. Sub-Lts. promoted to temp. Lt., R.N.V.R., all with seniority Oct. 5th:—W. H. Reid, G. Gude, R. V. B. Loxley, R. D. Seddon, V. H. Ridewood, H. I. Dear, N. Sladden, D. E. Garnett, A. J. Currie, H. L. Crowther, G. Hindle, C. L. Robinson, A. J. Dreydel, R. A. Allport, C. Horsfield, H. M. Beddall, R. R. Alexander, R. M. N. Perks, F. W. Mansell, E. D. Galloway, C. Lightfoot, J. P. Bourke, H. W. Blake, F. J. Dean, A. T. Lee, D. L. Gillmore, S. T. Baker, F. W. Hill, J. M. Burke, H. Foord, A. Scarrisbrick, F. Smythe, H. C. Mallett, E. H. Bellew, C. G. More, E. C. W. Fitzherbert, and J. A. Macnab.

Messrs. S. Thomas and F. W. R. Martino granted temp. commissions as Sub-Lt., R.N.V.R., and appointed to the "President," additional, for R.N.A.S., to date Oct. 7th.

Messrs. A. J. Guzner and C. J. Clayton entered as proby. Flt. Sub-Lts., for temp. service, and appointed to the "President," additional, for R.N.A.S., to date Sept. 3rd.

* * *

The following communiqué was issued by the Secretary of the Admiralty on Oct. 3rd:—

A further attack was carried out on the morning of the 2nd inst. by naval aeroplanes upon the enemy airship sheds in the vicinity of Brussels.

One of our machines failed to return.

* * *

The following communiqué was issued by the Secretary of the Admiralty on Oct. 7th:—

From Sept. 13th to the 22nd a series of attacks were carried out by naval aeroplanes operating against the Bulgarian coast.

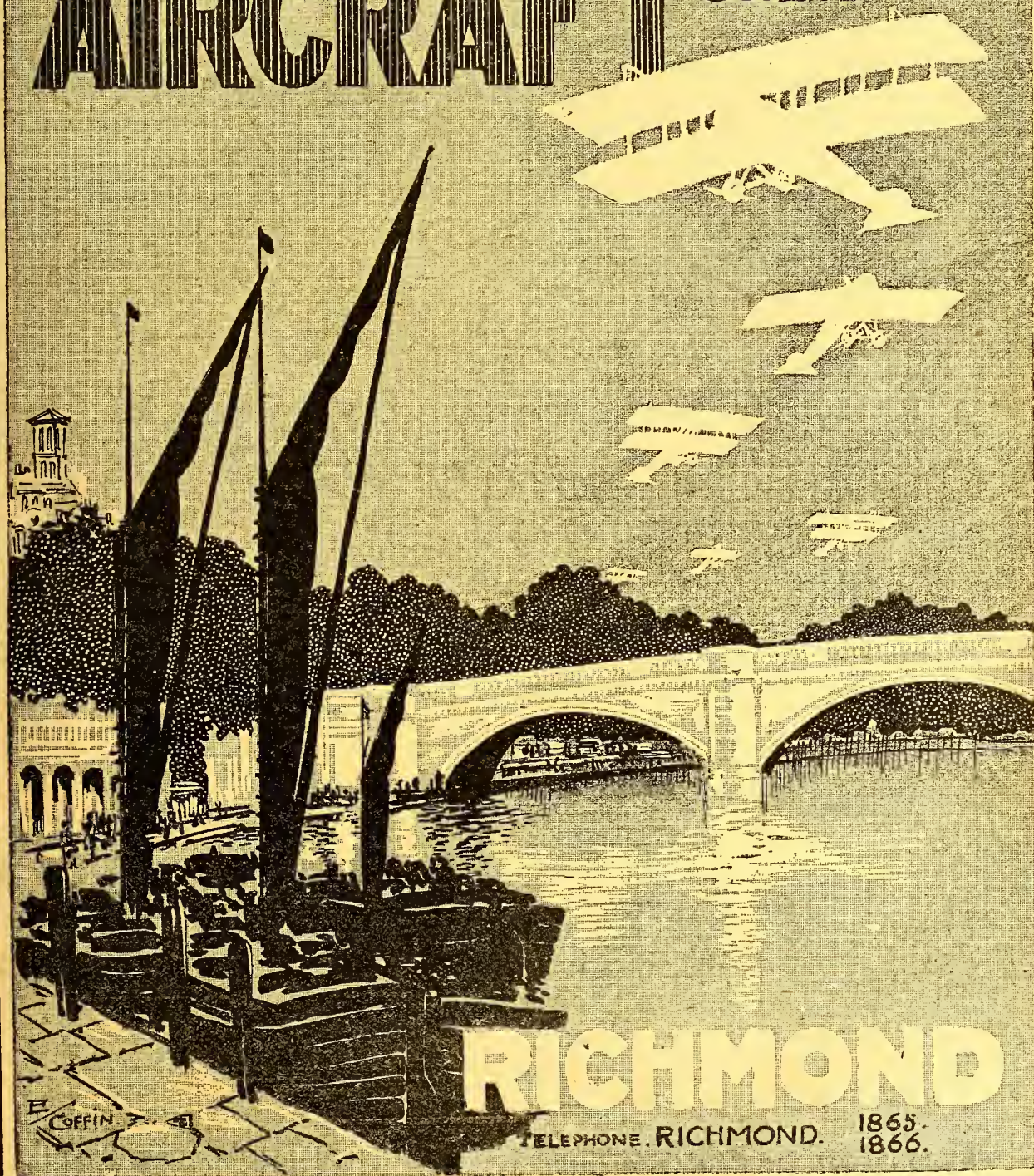
On the 13th the Headquarters of the Bulgarian 10th Division at Bademli Chiftlik were attacked, with considerable effect. Subsequently these Headquarters were removed elsewhere, but were discovered and attacked three days later, with excellent results. A large explosion was caused and a fire, which lasted for a considerable time, broke out among the buildings.

On the 16th considerable damage was caused to transport proceeding on the road towards Drama, and on the same day the shipping in Fouljes Harbour was bombed.

On the 17th and 18th the rolling stock, gun emplacements, and stores at Drama Station were bombarded and considerable damage done to them.

On the 19th a column of troops and transport were thoroughly plied with small bombs, which caused considerable damage and confusion.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

On the 21st points of military importance on the Seres-Drama road were attacked.

THE CASUALTY LIST.

Reported Oct. 7th.

MISSING.—Chadwick, Flt. Sub-Lt. Arnold J., R.N.
PREVIOUSLY REPORTED MISSING, NOW REPORTED TO BE A PRISONER IN TURKEY.—Dacre, Flt.-Comdr. George Bentley, D.S.O., R.N.

PERSONAL NOTICES.

DEATH.

JENKINS.—At an inquest held on Flt. Lt. Cyril Donald Jenkins, of Swansea, on Oct. 5th, who was killed while flying, the evidence showed that engine trouble occurred while he was ascending. The jury found that death was due to shock.

MARRIAGE.

YEO—CLAYTON.—On the 7th inst., at St. James's Church, Piccadilly, by Naval Chaplain the Rev. F. W. R. Metcalf, Frank Ash Yeo, Flt. Sub-Lt., R.N.A.S., only son of F. Cory Yeo, Esq., of Holme Park, Sonning, Berkshire, and Dan-y-Coed, near Swansea, to Murray Ethel, only daughter of Henry R. Clayton, Esq., of 42, Regent's Park Road, N.W.

BIRTHS.

FLETCHER.—On Oct. 2nd, at 32, Park Drive, Hampstead, N.W., the wife of Major J. N. Fletcher, R.E. and R.N.A.S., of a daughter.

* * *

SITWELL.—On Oct. 5th, at 14, Windsor Terrace, Sliema, Malta, Margery, daughter of Mr. and Mrs. L. H. Barnard, of 9, Chester Place, Regent's Park, N.W., and wife of W. G. Sitwell, Flt. Comdr. and Lt., R.N., of a daughter.

MILITARY.

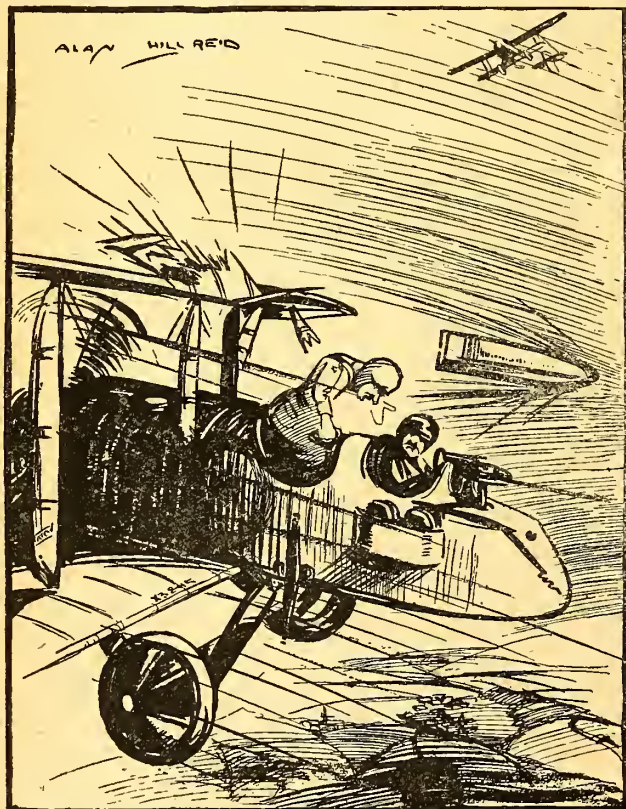
G.H.Q. COMMUNIQUÉS.

Oct. 3rd, 10.25 p.m.—The weather has interfered with the work of our aircraft. Yesterday one of our machines was missing.

Oct. 7th, 10 p.m.—The work of the infantry was, as usual, greatly assisted by our aircraft.

In spite of bad weather, during the past five days our aeroplanes have done valuable work and dropped a large number of bombs on the enemy.

Oct. 8th, 10.10 p.m.—Yesterday, in spite of difficult weather, our aeroplanes did useful work. One of our machines is missing.



Indignant Pilot (in unrivalled-for-speed-climb-and-stability Biplane) overtaken by a Shell: "Chuck that blooming gun overboard, and duck your head, and we'll beat the blighter yet!!!!"

From the Boulton and Paul Magazine

An official dispatch from British Headquarters in France, dated Oct 3rd, contains the following:—

Our aircraft have shown in the highest degree the spirit of the offensive. They have patrolled regularly far behind the enemy's lines, and have fought many battles in the air with hostile machines and many with enemy troops on the ground. For every enemy machine that succeeds in crossing our front it is safe to say that 200 British machines cross the enemy's front.

A captured Corps report described our aeroplanes as "Surprisingly bold," and their work has been as conspicuous for its skill and judgment as for its daring.

* * *

WAR OFFICE COMMUNIQUÉS.

Oct. 3rd.—The General Officer Commanding the British Forces at Salonika reports:—The Royal Flying Corps carried out successful bombing attacks on troops and transport in Prosenik (half-way between Seres and Demir Hissar), and on a railway train travelling from that place to Seres.

Oct. 4th.—The General Officer Commanding the British Forces at Salonika reports:—Yesterday British aeroplanes dropped bombs on the station of Prosenik just opposite our lines, which was being used as a dumping station by the enemy. Much damage was caused to a train.

Oct. 6th.—The General Officer Commanding-in-Chief in Egypt reports:—On Oct. 4th our aeroplanes carried out a successful bombing attack on enemy camps in the neighbourhood of El Arish. It appears that our recent aerial attacks on the enemy aerodrome at El Arish have had the effect of compelling the enemy to move their machines and hangars from that place.

Oct. 6th.—The General Officer Commanding British Forces in Mesopotamia reports:—On Oct. 1st bombs were dropped by our aeroplanes on the hostile camp at Kut-el-Amara.

Oct. 8th.—The General Officer Commanding the British Forces at Salonika reports:—On the Doiran front there was the usual artillery bombardment. One enemy aeroplane was forced down behind their lines by our aviators.

* * *

THE CASUALTY LIST.

Reported Oct. 4th.

WOUNDED.—Field, Capt. A. W., Machine Gun Corps, attd. R.F.C.

Haward, Sec. Lt. R. S., R.F.C.

Philippi, Sec. Lt. G., Dragoons, attd. R.F.C.

Simon, Sec. Lt. N. E. S., R.F.C.

Reported Oct. 5th.

WOUNDED.—Drake, Sec. Lt. L. V., Yeomanry and R.F.C.

Livingstone, Sec. Lt. A. F., R.F.C.

Welchman, Capt. P. E., R.E. and R.F.C.

MISSING.—Coller, Lt. B. T., R.F.C.

Echlin, Sec. Lt. F. St. J. F. N., R. Fusiliers, attd. R.F.C.

Scaife, Sec. Lt. T. E. G., Dragoon Guards, attd. R.F.C.

DIED OF WOUNDS.—R.F.C.—Norman, 2422 2nd A.M. C. E.

WOUNDED.—R.F.C.—Taylor, 7971 2nd Air Mech. S. G.

Reported Oct. 6th.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Brooke-Murray, Capt. K. A., A.S.C., attd. R.F.C.

WOUNDED.—Smith, Sec. Lt. B. V. S., R. Warwick Regt., and R.F.C.

MISSING.—Dendrino, Sec. Lt. S., R.F.C.

Lowson, Lieut. J. H., Royal Scots, attd. R.F.C.

Taylor, Sec. Lt. H. A., R. W. Kent Regt. and R.F.C.

Reported Oct. 7th.

WOUNDED.—Franklin, Lt. R. V., R.F.C.

MISSING.—Easom, Sec. Lt. A. T., R.F.C.

Reported Oct. 8th.

KILLED.—King, Sec. Lt. C. H. M., R.F.C.

Roche, Sec. Lt. C. P. V., R.F.C.

MISSING.—Lansdale, Lt. E. E., A.S.C. and R.F.C.

R.F.C.—Glover, 1864 Sgt. J. E.; Irwin, 3389 Sgt. B.

Reported Oct. 10th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Jowett, Lt. E. C., R.F.C.

WOUNDED.—Bell, Sec. Lt. C. H., R.F.C.

Biette, Sec. Lt. F. C., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS AS PRISONER OF WAR IN GERMAN HANDS.—Burgess, Lt. R., Army Cyclist Corps, attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER OF WAR IN GERMAN HANDS.—Robertson, Lt. J. G., R.F.C.

PREVIOUSLY REPORTED PRISONER OF WAR, NOW REPORTED WOUNDED AND PRISONER OF WAR IN GERMAN HANDS.—Firstbrook, Sec. Lt. J. H., R.F.C.

DIED OF WOUNDS.—R.F.C.—Walker, 5569 Cpl. D. B.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS.—R.F.C.—Robinson, 10387 2nd Cl. Air Mech. T. N.; Topliffe, 1746 Sgt. G.

* * *

It was announced by the War Office on Oct. 4th that the King

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has been graciously pleased to appoint the following officers Companions of the Distinguished Service Order, in recognition of their gallantry and distinguished service in connection with the successful attack on enemy airships:—

Sec. Lt. FREDERICK SOWREY, R. Fus., attd. R.F.C.

Sec. Lt. ALFRED DE BATH BRANDON, M.C., R.F.C., Spec. Res.

Sec. Lt. F. Sowrey is 23 years old, having been born at Gloucester on Aug. 25th, 1893, and is the second son of Mr. John William Sowrey, of Staines, Deputy Chief Inspector of Taxes at Somerset House. He was educated at King's College School, Wimbledon, and King's College, London. He was studying for the Indian Civil Service, but on war being declared was granted a commission in the Royal Fusiliers. He saw service in France with his regiment, and was wounded in the Loos attack in September last year. Mr. Sowrey was wounded afterwards at Ypres, and invalided home in November. He joined the R.F.C. last January, took his pilot's certificate in June, and has been night flying since. He had flown during three raids before that on which he recently brought down a Zeppelin in Essex, and was flying with his friend, Lt. Robinson, V.C., when the latter brought down the raiding airship at Cuffley a month ago.

Mr. Sowrey has two brothers, also in the R.F.C. The elder, John, is Capt. and Flt. Comdr., also engaged as a night pilot in aerial defence, and the younger, William, is serving as a pilot with the Expeditionary Force.

Sec. Lt. A. de B. Brandon was born in New Zealand in 1884. Educated at Wellington College, New Zealand, and Trinity Hall, Cambridge, he was called to the Bar in 1906, and after a short period in England returned to New Zealand, where he had been practising until the war broke out. Soon after the declaration of war he came to England, and eventually he joined the Flying Corps in December, 1915.

Mr. Brandon receives the D.S.O. for gallant conduct and for devotion to duty, and not for destroying or assisting to destroy any particular Zeppelin. On the night of March 31st-April 1st, when Zeppelins dropped nearly 200 bombs, causing 109 casualties, he dropped several bombs over one of the raiders as a height of 9,000 ft., and his aeroplane was hit many times by machine-gun bullets. France (on Oct. 7th), describing the operations in the Le Sars estuary and another raider was hit and dropped part of its equipment in one of the Eastern Counties. Mr. Brandon also had a share in the destruction of the Zeppelin which was brought down on Sunday. Some time ago he dropped several bombs on an enemy seaplane at Dover.

* * *

The constitution of the appointment of equipment officer second class in the R.F.C. (Military Wing) is announced in Army Orders, with pay at the rate of 18s. a day, to include flying pay.

The appointments of equipment officer and assistant equipment officer are in future to be styled equipment officer first class and equipment officer third class respectively.

* * *

The "Times" special correspondent at British Headquarters in France (on Oct. 7th) describing the operations in the Le Sars district, says:—

"I do not think that our domination of the air above the battlefield has ever been more evident than it was to-day. All day, above the area where the fighting was in progress, the skies were flecked with our aeroplanes, and nowhere was a German machine to be seen. Behind us, as we stood on the slope of the ridge, swung in mid-air an almost continuous line of our observation balloons. One could count fifteen over the right of the front alone. Beyond on the enemy's side, somewhere beyond Le Transloy, so low that it can have been of little, if of any, use, was one solitary dot of a German balloon. And almost immediately when our attack began it was hauled down, whether terrified by our circling aeroplanes or because our guns drew too near it, I do not know. We were left in complete dominion of the skies."

* * *

The following remarks with reference to aircraft appear in the report by General Sixt von Arnim, commanding the IVth German Corps, which was captured during the recent advance and published by official sanction:—

"The numerical superiority of the enemy's aviators, and the fact that their machines were better, was made disagreeably apparent to us, particularly in their direction of the enemy's artillery fire and in bomb-dropping. . . . The number of our battle-planes was also too small. The enemy's airmen were often able to fire successfully on our troops with machine guns, by descending to a height of a few hundred metres. The German anti-aircraft gun sections could not continue firing at that height without exposing their own troops to serious danger from fragments of shell. . . . A further lesson to be learned from this exceedingly bold procedure on the part of the English aviators is that the infantry make too little use of their rifles in driving off aircraft."

Summarising the needs of his corps, General von Arnim asks for increases in all kinds of equipment, including:—

"Anti-aircraft sections, anti-aircraft machine guns, captive balloons, reconnaissance and battle planes."

It is reported that Capt. and Flt. Comdr. A. Ball, D.S.O., M.C., was interviewed while on leave at his home in Nottingham and admitted having taken part in over 100 air fights. During the four months he has been fighting in France he has destroyed some 30 German machines, and has himself been brought down six times, but without personal injury. "I have met only one German airman who had any spirit," he said. "That," he added, "was the most sporting fight I had. We went at each other for half an hour, and then, our ammunition gone, flew side by side and grinned at each other 'in mutual admiration.' I hope to meet that German again; he is a sportsman."

[One sincerely hopes that the young officer never delivered himself of any such speech. The average R.F.C. pilot finds considerably more than one per cent. of German pilots with spirit,—as the Casualty List proves,—and the "mutual admiration" phrase is hardly the form of the old Army.—Ed.]

PERSONAL NOTICES.

DEATHS.

BAKER.—A verdict of accidental death was returned on Oct. 9th at an inquest on Sec. Lt. Harold Baker, R.F.C., a Canadian, who was killed on Oct. 8th. The evidence of a brother officer showed that when at a height of 2,000 feet Mr. Baker dived steeply. On his trying to climb after the dive the machine collapsed and fell to the ground, Mr. Baker being killed instantly. He was a good pilot. The accident was attributed to excessive speed caused by the dive.

* * *

DAVIDSON.—On Sept. 26th, of injuries received in flying accident (England), Sec. Lt. Alexander B. Davidson, dearly loved and only child of Mrs. Owen Davidson, of Portugal. Friends, please accept this (the only) intimation.

* * *

DODGSHON.—Sec. Lt. John Hampson Dodgshon, Surrey Yeomanry and R.F.C., son of the late Edmund Dodgshon, of Manchester, was killed on Oct. 1st whilst flying in England, at the age of 25. He was educated at Westminster, and was a member of the school cadet corps. He joined the H.A.C. in July, 1913, and played Rugby football for the corps. He went abroad with the H.A.C. in Sept., 1914, and spent the first winter of the war fighting in Flanders and France. He was invalided home, and on his recovery was gazetted a commission in the Surrey Yeomanry. He served for six months in Egypt, and was at the Dardanelles as Assistant Military Landing Officer. On his return to England he declined a post as Assistant Equipment Officer in the R.F.C., as he felt he ought to take a more active part in the war. He obtained his "wings" last August, and was made an instructor. His commanding officer writes of him:—"His memory will be green for ever."

* * *

ECHLIN.—Sec. Lt. Frederic John Ford North Echlin, Royal Fusiliers and R.F.C., the only son of the late Capt. Frederick Echlin, Royal Navy, and of Mrs. Echlin, of Walton-on-Thames, is officially reported missing by the War Office.

His mother has heard from Lt. Echlin's commanding officer that the gallant officer was seen to lose control of his aeroplane, which crashed into the front of the enemy's lines. He had only been at the front a fortnight, having previously been for a year at Brooklands as Assistant Equipment Officer.

* * *

JACQUES.—On Oct. 5th, at Upavon, in a collision in mid-air, Geoffrey P. L. Jacques, Sec. Lt., R.F.C., second son of Sergt. and Mrs. J. H. Jacques, Loughton, aged 18 years.

* * *

KING.—Sec. Lt. Cyril Henry Marshall King, R.F.C., who was killed on Sept. 30th, was the youngest son of the Rev. E. G. King, D.D., rector of Gayton, Northamptonshire. He was educated at the Preparatory School, Sherborne, Aldenham, and Birmingham University, where he studied engineering and gained a scholarship for research in his final B.Sc. Exam.

When the war broke out he enlisted in the Universities and Public Schools Brigade, and afterwards obtained a commission in the R.G.A.

He went to the front in 1915, transferred after some months to the R.F.C., and was gazetted as an Observer. Last June he came to England for his pilot's course, and he returned to the front in August.

* * *

KEITH LUCAS.—Killed in a flying accident, on Oct. 5th, Capt. Keith Lucas, R.F.C., D.Sc., F.R.S., second son of Mr. and Mrs. F. R. Lucas, of Queen Anne's Mansions, Westminster, and Chelwood Gate, Sussex, and dearly loved husband of Alys Lucas, of Fen Ditton, Cambridge, aged 37.

Capt. Keith Lucas, who was killed in the same accident which cost Mr. Jacques his life, had already acquired a world-wide reputation as one of the most promising physiologists of the younger generation. The older methods of research have in certain directions ceased to be fruitful; they are no longer adequate to settle the problems which present themselves. These

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problems require not only an intimate knowledge of physiology, but a most delicate command of instrumental methods. In designing instruments for investigation and in ability in handling them Keith Lucas stood alone.

Dr. Lucas, who was born in 1879, was the son of Francis Robert Lucas, and was educated at Rugby and Trinity College, Cambridge, of which he became a Fellow in 1904. He was elected F.R.S. in 1913, and was invited to give the Croonian lecture to the Royal Society even a year before his election to it.

Before the war he was fully engaged in both teaching and research work at Cambridge, and was, moreover, one of the directors of the Cambridge Scientific Instrument Company. But on the outbreak of war all this was put aside in order that he might devote his rare instrumental skill and inventiveness to the Flying Services.

The following appeared in the report of the Advisory Committee for Aeronautics for 1916:—"A close study of the conditions affecting the aeroplane compass, with a view to its development and improvement, was undertaken at the Royal Aircraft Factory by Dr. Keith Lucas, F.R.S. As a result a type of instrument specially adapted for employment on an aeroplane under the varying conditions which arise in flight was ultimately produced and standardised. This is the R.A.F. Mark II. compass, which is now being made in large numbers. Fliers are much indebted to Dr. Lucas for the success attained in this investigation." But the compass was by no means his only achievement, and he became more and more engrossed in the work as time went on.

Dr. Lucas married, in 1909, Alys, daughter of the Rev. C. E. Hubbard, and leaves three sons.

ENGAGEMENTS.

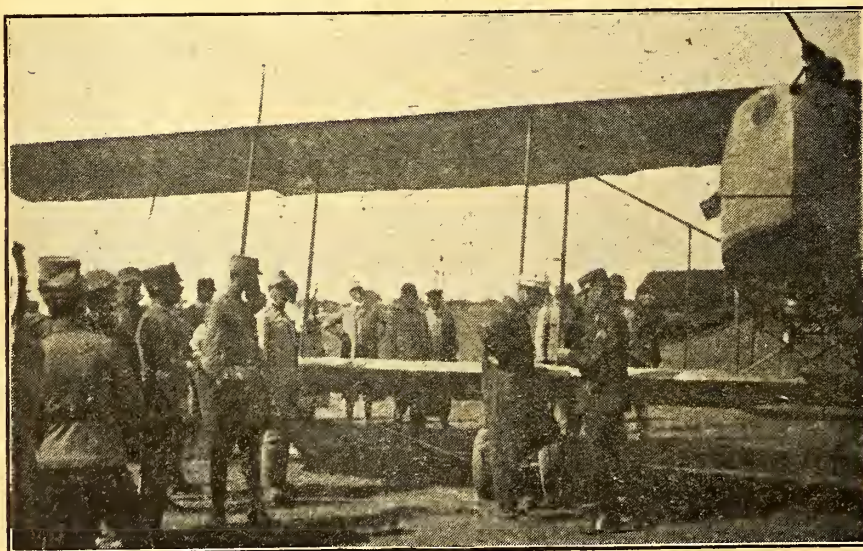
STUART — GRANT-DUFF-AINSLIE — An engagement is announced, and the marriage will shortly take place, between Capt. Alexander W. Ruthven Stuart, Gordon Highlanders and R.F.C., younger son of the late William Whitewright Stuart and of Mrs. Ruthven Stuart, of 35, Sloane Gardens, S.W., and grandson of the late James Stuart and of James Alexander Ruthven, also great-nephew of the late William Whitewright, and Stella Marion Grant-Duff-Ainslie, eldest daughter of Julian Grant-Duff-Ainslie, of the Old Hill House, Hellingly, Sussex, and granddaughter of Mr. and Mrs. Ainslie, of Delgaty Castle, Aberdeenshire.

* * *

TOMLINSON—WICKHAM.—An engagement is announced between Capt. Hugh Tomlinson, Military Cross, R.F.C., son of the late G. W. Tomlinson, J.P., and Mrs. Tomlinson, 65, Iverna Court, Kensington, and Madeleine de Lacy (Madge), eldest daughter of Capt. C. A. Wickham, R.A.M.C., and Mrs. Wickham, Willesborough, Ashford, Kent.

* * *

RABAGLIATI—PRIESTLEY.—A marriage has been arranged between Capt. (temporary Major) Cuthbert Euan Charles Rabagliati, King's Own Yorkshire Light Infantry and R.F.C., M.C., younger son of Andrea C. Rabagliati, M.A., M.D., of Whinbrae, Ben Rhydding, Yorks, and grandson of the late Duncan McLaren, M.P. for Edinburgh, and Monica, only daughter of Joseph Child Priestley, K.C., of Tatmore Place, Hitchin, and granddaughter of the late Sir William Overend Priestley, M.D., of 17, Hertford Street, Mayfair, and M.P. for Edinburgh and St. Andrews Universities.



The First French Aeroplane to land at Bukarest from Salonika, after bombarding Sofia on the way.—Photographed immediately after its arrival.

BIRTHS.

DONALD.—On Tuesday, Oct. 3rd, at 11 Beaumont Gate, Glasgow, the wife of Sec. Lt. R. Donald, R.F.C., of a son.

* * *

FOLLIT.—On Wednesday, Oct. 4th, 1916, at 53, Ritherdon Road, Balham, London, S.W., Lillian (née Watkins), wife of Reginald W. Follit, Lt., R.F.C., B.E.F., a son.

* * *

READ.—On Oct. 4th, at 13, Princes Gate, the wife of G. J. Read, Lt. R.F.C., of a daughter.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Oct. 3rd.—Yesterday our pilots brought down a German machine, which fell near Condé le Sutry (region of Vouziers). Sergeant Sauvage yesterday brought down his fifth German machine in a brisk fight. The enemy aeroplane fell south of Transloy (east of Flers).

Oct. 4th.—The bad weather interfered with flying operations on the greater portion of the front.

Oct. 5th.—In spite of very bad weather one of our aeroplanes bombarded the aviation ground of Colmar (Alsace).

During a night flight 90 bombs were dropped on the electric searchlights and the military buildings of the port of Zeebrugge.

Oct. 6th.—In spite of unfavourable atmospheric conditions our aeroplanes carried out 29 flights in pursuit of enemy machines and in reconnoitring and observing for artillery purposes.

A German aeroplane has been brought down.

Army of the Orient.—Our aeroplanes report great activity on the enemy's railway lines.

Oct. 7th.—An enemy squadron dropped 25 bombs on Belfort. Nobody was hurt, and the material damage done was insignificant.

Yesterday our aircraft carried out a number of flights for purposes of artillery observation and reconnaissance. Four fights were fought, in the course of which, in addition to the German machine which was brought down south of Péronne, and which was reported in last night's communiqué, an Albatros fell headlong in its own lines south of the Bois de Haudronviller.

Thirty-four 120 mm. shells were dropped on the new German railway station at Vigneulles.

Oct. 8th.—Our aeroplanes have regulated the fire of our guns and located many batteries in action in the Somme area. They fought six air fights, and have bombarded Moislains (east of Bouchavesnes) and the Vaux Wood, North of Péronne.

* * *

The following semi-official statement was issued on Sept. 3rd:—

Our British Allies are not in the habit of mentioning, as we are, the names of the aviators who, like Guynemer, Nungesser, and Navarre, add without ceasing new Boche machines to the total of casualties. They exist, however, and they have to their credit some superb records. One pilot, Captain Albert Ball, twenty years of age, has brought down twenty-nine German aeroplanes and one Drachen. Like Nungesser, he destroyed three machines in a single morning.

Without, however, stopping to consider the individual valour, let us look at the figures of the British Army since July 12th.

During the month of July forty-six German aeroplanes were brought down, sixteen were damaged and disabled, one was brought down by anti-aircraft batteries.

During August eighteen German machines were destroyed, thirty-eight were brought down more or less damaged, and one was brought down by gunfire.

September was still more brilliant. Up to the 27th fifty enemy machines were brought down, sixty were hit under very difficult conditions, one was a victim of anti-aircraft fire, and six Drachens were burnt, making a total of 123 machines destroyed and 114 suffering a more or less disastrous fate. All this occurred in the space of twelve weeks' fight.

British raiders have not shown themselves less active, for they have dropped thousands of tons of bombs every day on German territory or on land occupied by the Germans.

The communiqué records numerous bombing operations carried out in the space of a week, and recalls the attack on Libercourt on Sept. 25th. This operation deserves special mention, for it was conducted with as much skill as audacity. The object was to interrupt traffic on the railway from Lille to Douai. Trains were running south carrying reserves or munitions for the Battle of the Somme.

Patrols were first of all sent over the aerodromes in order to

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IMPORTANT NOTICE RE STOCK LIST. For the convenience of Aircraft Manufacturers we have decided to issue an Illustrated List, monthly, and a Stock List, weekly, on Wednesdays in future instead of fortnightly as hitherto. The complete and revised ILLUSTRATED STOCK LIST (containing about 32 pages) will be sent out on the first Wednesday of EVERY MONTH, and a small WEEKLY SUPPLEMENT (not illustrated) will be issued EVERY INTERVENING WEDNESDAY EVENING, giving particulars and prices of all stock in hand up to the time of going to press.

DATES OF ISSUE—MONTHLY LIST (completely illustrated, about 28 pages), No. 27 Wed., Nov. 1st. WEEKLY LIST (giving prices and particulars of stock on hand—not illustrated), No. 26a, to-day, Wed., Oct. 11th; No. 26b, Wed., Oct. 18th; No. 26c, Wed., Oct. 25th.

A SPECIAL LIST OF A.G.S. PARTS will be published on Nov. 1st next. This will contain about 28 pages and will include all the most important items. Each part will be illustrated by reproduction of actual photographs and blue print drawings. Complete dimensions and R.A.F. Material Specifications of all marked numbers will be given.

This List will be of great value to Aircraft Manufacturers and most useful for reference in connection with our regular Monthly Stock List. Copies may be had free on application when ready.

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hold in check the German aviators able to interfere with the British pilots entrusted with the attack. Bombs emitting strong fumes and explosive shells were thrown on the enemy aviation grounds, where great excitement soon prevailed.

While this was going on attacking squadrons, with other aeroplanes in attendance, crossed the sky waiting for the opportune moment. The first train was seen to leave Libercourt at 1.40 p.m. The second train was arriving on the line between Heninlietart and Ostricourt, where it joins the main line.

Capt. C— and his machine gunner, Sergt. J—, descended to about 800 ft. over the first train near Ostricourt, and successfully dropped six bombs. The engine was hit and jumped the rails, three coaches were telescoped, and the maddened German soldiers got out of the carriages, looked for a way of escape towards Ostricourt, and in the direction of a wood near by, but Capt. C— went still lower, and fired on the disorganised crowd, leaving numerous dead and wounded on the ground. The second train then arrived, but the first blocked the junction.

Lieut. W— and his gunner carried out a manoeuvre similar to that of Capt. C—. Three bombs fell right on to the train. The German troops were panic-stricken and tried to flee across the fields towards Euvin. Followed, however, by machine-gun fire they had a difficult task. No fewer than 100 were killed or wounded in the two trains. At two o'clock attacking aeroplanes went to the station at Libercourt, on which they dropped fourteen bombs of 11 lb. and thirty-four bombs of 20 lb. Buildings were blown up and the railway destroyed.

All the British machines returned safely.

* * *

It is reported that a letter taken from a German officer complains that he had lost several men of his company shot through the head by the fire of a mitrailleuse from an aeroplane. The unfortunate men must sit under these bombardments, and dare not even fire back at the aeroplanes through fear of disclosing their positions.

* * *

It is reported that Sergt.-Aviateur Sauvage has just brought down his fifth German aeroplane. He is the youngest French aviator to be mentioned in dispatches. He is 19½ years of age, having been born in February, 1897. His uncle, who brought him up, says:—

His one desire since he was 14 was to become an aviator. At 16 he was apprenticed to a small aeroplane builder. He worked hard, and under the direction of the aviator Gilbert he built a machine, to which he added some small improvement. He had just gone to Valenciennes to try this machine when war broke out, and he had to make off, leaving the aeroplane behind, which presumably fell into the hands of the Boches. After one year of war he managed to get taken into the aviation service, got his pilot's licence last March, and went to the front three months ago. When I saw him on leave for six days three weeks ago he had bagged three enemy machines. He got his fourth and fifth in the last fortnight.

* * *

It is reported that the Aviation-Militaire possesses a Chinese pilot. He flies in the French sector of the Somme front. His name is Tsu, a thirty-year-old Chinaman, the son of a rich merchant of Shanghai.

He went to France a little before the outbreak of war to learn flying, and as soon as war was declared he offered his services to the French Government.

Some weeks ago, when returning from a scouting expedition, he was attacked by six German aviators, but he returned safely. Since then he has been in several actions and has brought down two German machines.

GERMANY.

OFFICIAL COMMUNIQUÉS.

Oct. 4th.—Eastern theatre of war: Army front of Prince Leopold of Bavaria:—

Lieut. von Cossel was set down from an aeroplane by non-commissioned officer Windisch south-west of Rowno, and was fetched again 24 hours later. He blew up the railway line between Rowno and Brody at several points.

Oct. 5th.—Our aviators, who had already on the preceding days by successful attacks caused damage to stores, troop camps, and railway premises, yesterday dropped numerous bombs, setting fire to the railway station of Rozhishche (between Lutsk and Kovel) and buildings on the communication lines in the vicinity.

Oct. 6th.—An airship and some aviators attacked with bombs the railway establishments and troop encampments north of the Danube.

Oct. 8th.—Five enemy aeroplanes were shot down in air flights or by anti-aircraft guns. Capt. Böcke placed his 30th opponent hors de combat.

On Oct. 5th German seaplanes attacked some big armed Russian transport steamers in the Black Sea east of Tuzla and hit them.

Other German seaplanes successfully dropped bombs on hostile munition columns in the Northern Dobrudja.

On the afternoon of Oct. 1st (? Oct. 2nd) naval aeroplanes from



The late Lieut. von Parschau, one of Germany's best pilots, recently killed on the French front. An excellent example of the best class German officer-aviator, a type which is now becoming scarce.

the aerodrome at Zeebrugge pursued an enemy air squadron, and in the fighting which ensued shot down an enemy aeroplane.

* * *

An official statement issued in Berlin and published in the "Times" of Oct. 10th contained, first, an urgent call for the "greatest efforts" on the part of German aviators, and, secondly, a statement of their aeroplane losses in September which is wholly at variance with the reports of British General Headquarters and the French Ministry of War.

The statement reads thus:—

The greatest efforts are called for from our aviators on observation duty for our artillery and the aviators covering them. The difficult tasks of the aviator on observation duty can only be carried out if the protecting aviators keep off the enemy aviators.

An unprecedented number of air fights have taken place and ended successfully for us.

In September we lost 20 aeroplanes in air fights and one machine is missing.

The British and French losses are 97 in air fights, 25 shot down from the ground, and 7 forced to land in our lines—total 129. About half the enemy's losses were in his own lines and the other half in ours.

As to the German estimate of their losses, it is not necessary, perhaps, to do more than contrast it with the figures given for September by the British and French military authorities:—

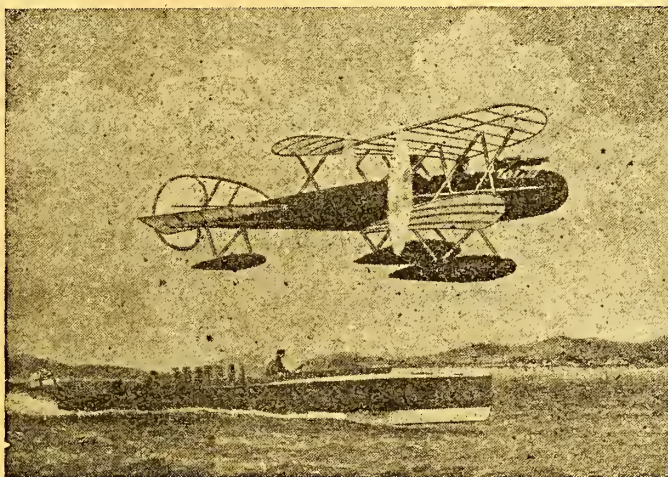
The number of German machines reported by British Headquarters as having been destroyed was 53; 47 others at least were driven or brought down damaged. A loss of 48 British machines was admitted. The French aviators and gunners brought down 100 German machines, some of them in flames, and a large proportion under such conditions as to warrant the conclusion that they would be destroyed on landing. In their daily reports, the

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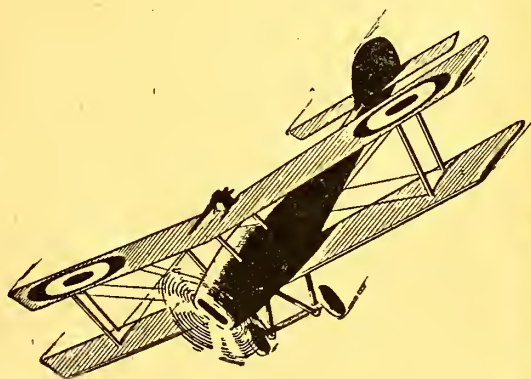
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Germans claimed to have accounted for 116 enemy machines in September.

Appropos of the German aviators' observation work the "Times" correspondent at British Headquarters in France remarked, on Oct. 9th, that during the last week or two they had been showing increased activity, almost an "uppishness," on the Somme front.

One assumes (he wrote) that they have been stung to action by the contempt into which the German Air Service has sunk in the eyes of German soldiers, for there is hardly a prisoner taken who does not speak bitterly of his own flying corps. As we have driven the enemy from the high ground, moreover, the need of observation from the air has become daily more imperative; so a tremendous effort has evidently been made to mass enough machines here to recover some measure of their lost supremacy.

And in another dispatch dealing with the British advance on Saturday which also appeared in the same issue, he said:—

I do not think that our domination of the air above the battlefield has even been more evident than it was to-day. All day, above the area where the fighting was in progress, the skies were flecked with our aeroplanes, and nowhere was a German machine to be seen.

* * *

It is reported by the "Daily Express" that two British naval aviators who were brought down within the German lines have been arrested at the instigation of the German Government, and are to be tried by court martial because what are known as "tracer" bullets were found in their possession.

"Tracer" bullets are used by all the combatant Powers. One of these bullets is placed at long intervals in each belt of cartridges, and when it is fired the gunner can see the precise spot at which he is firing, and can therefore, if necessary, correct the range.

These bullets do not contravene the terms of The Hague Convention; in fact, they are not even intended to kill. The Germans use these bullets themselves. If the aviators are found guilty by court martial, the probability is that they will be shot.

The British Government have, through the American Embassy, made representations to the German Government on the subject, and have intimated that "tracer" bullets were found in the ammunition for the machine guns of the Zeppelin airship whose crew surrendered in Essex.

It is to be hoped that the British Government have made it clear to the Germans that the crew of the Zeppelin will be treated precisely in the same manner as are our own aviators who have been taken prisoners.

* * *

It is reported that the raid on Mannheim which was carried out by a French aviator on the night of Sept. 22nd did considerable damage.

The aviator dropped bombs on the airship hangars and hit his mark. It is affirmed that bombs fell on one of the principal hangars and destroyed a Zeppelin of 230 metres in length, fitted with eight engines. A large quantity of repairing implements and machinery which was in close proximity was also destroyed. A gas reservoir standing on the aviation ground was also hit and exploded.

The railway from Mannheim to Niederheim was greatly damaged. The rails of the junction lines have been destroyed over a considerable distance. The raid took place at an hour when work was at a standstill, yet twenty-six dead bodies and forty-five people suffering from injuries were carried away from the aerodrome and its immediate vicinity.

It is said that in order to prevent news of this disaster from being spread about the town of Mannheim had been isolated, and all access to it forbidden until Oct. 10th.

* * *

The "Kölnische Volkszeitung" consoles the public for the mishaps to Zeppelins in England. It says that from the wreck of an airship the British would be unable to copy a Zeppelin or find out its secrets. Even if the British were to reconstruct one of the Zeppelins they would only find that the airship was unmanageable, like the first Zeppelin of 1900. The journal concludes:—"The loss of two Zeppelins is much to be regretted, owing to the loss of the crews, but the event means no gain for the British."

* * *

It is reported from Constance that the commander of the last Zeppelin brought down in England was named Bernhard Schreibe-Mueller, one of the most experienced of German airship pilots. For his earlier exploits he was decorated with the Iron Cross of the First and Second Classes and the Bavarian and Hanseatic medals. Before entering the army he was an officer of the Lake Constance Navigation Company.

[There may be some confusion with one of the other Zeppelins which have been brought down. Certain it is that the commander of the one brought down near Potter's Bar last Sunday was described on his coffin-plate as "Commander Mathy." Possibly this officer commanded the ship the crew of which surrendered.—Ed.]

The Stuttgart "Association for the Promotion of Zeppelin Tours Abroad," has been dissolved, "as such excursions are impracticable in the near future!"

RUSSIA.

OFFICIAL COMMUNIQUÉS.

Oct. 5th.—On Oct. 3rd, when a raid of enemy seaplanes took place, one of them landed and was captured by us near the island of Runö, in the Gulf of Riga.

Oct. 7th.—In the region of the Zlota Lipa six aerial engagements were fought, in the course of which Sub-Lt. Orloff and Lt. Yanchenko chased an enemy aeroplane and fired incendiary bullets at it with success, the enemy aeroplane coming down enveloped in black smoke.

* * *

The "Daily Telegraph's" Petrograd correspondent, reviewing the Russian military position on Oct. 7th, says:—

At the Staff here the gratifying statement is made that during the recent fighting in Galicia the Russian air service has had great successes, not only widening the sphere of its activity, but even changing its character as a military instrument. As on the Western front, so here the aeroplane has ceased to be merely a means of scouting, and is becoming ever more and more a fighting weapon for use in the very thickest of the fray. This news is all the more welcome because until lately the air service was one of the weak spots in Russia's military equipment.

[One is glad to note that the aeroplane mentioned is doing such good, if solitary, work.—Ed.]

ITALY.

OFFICIAL COMMUNIQUÉS.

Oct. 3rd.—An enemy aeroplane dropped a bomb on Agordo (Cordevole) without causing any harm.

Oct. 4th.—Hostile aircraft dropped bombs on Monfalcone and elsewhere on the Lower Isonzo, killing one man and wounding another.

One of our air squadrons dropped bombs with good effect on the Nabresina railway station, on the Carso.

Oct. 8th.—A few enemy aeroplanes which were driven away by our artillery dropped bombs near Asiago, Gallio (three miles north-east of Asiago), and Fonzaso (15 miles north-east of Asiago), but without doing any damage.

Oct. 9th.—Hostile aeroplanes dropped bombs on Grigne (Sugana valley), on the Upper Fella valley, on the Grado lagoon, on Monfalcone, Cervignano, and Torre Zuino, doing a slight amount of damage to buildings.

* * *

On dit that at Turin turners and lathe-hands are as precious as pork in Germany. I learn, too, and this is fact, that the Chiribiri Co. there is working at forced draught on aero engines; and very deservedly, too, for the firm certainly flew their own machines with their own motors some time before any other concern in Italy did so.

* * *

The naval "Gazette" of 28th ult. makes honourable mention of the officers and men of the French Army and Navy and those of the Italian Services who affirmed themselves in the Parenzo-Trieste affairs of last month.

* * *

Capitaine de Frégate Arturo Ciano and Naval Lts. Garassino and Gravina are among the latter with other well-known pilots, while though all unknown to me, as are those of the French Services, yet the name of Sec. Lt. Garros seems to call for chronicling somehow.

* * *

Re the protection of St. Mark's at Venice, which I referred to before, I understand that an effort to cover up, i.e., immure, the mosaics may be made.

* * *

It is lamentable how many wealthy people have business at Milan at every full moon, says a Venice paper.—T. S. H.

ROUMANIA.

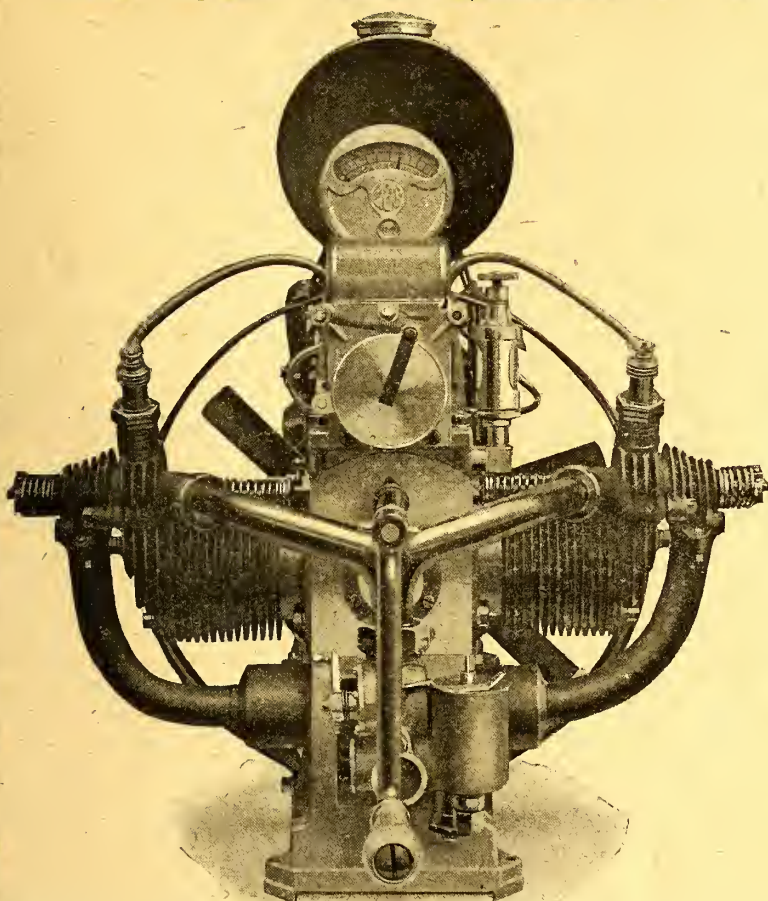
OFFICIAL COMMUNIQUÉS.

Oct. 9th.—A squadron of eight German aeroplanes flew over Bukarest at 11 o'clock and dropped bombs in the neighbourhood of the Gare du Nord and on some linen warehouses. The damage done was insignificant. The enemy aviators left half an hour later.

* * *

It was reported from Amsterdam on Oct. 9th that according to information received by the Roumanian Legation at The Hague the Roumanian Government has protested against the bombardment of Bukarest and other open Roumanian towns by German aircraft. The protest is brought to the knowledge of all the neutral Powers of Europe and the United States of America, and will be simultaneously communicated to the German Government by the American Embassy in Berlin.

The only result of these attacks has been that 250 innocent victims have come to harm, of whom more than 200 have been women and children, while among the remainder have been many sick and crippled, as 58 bombs have been dropped on hospitals and asylums.



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The protest denounces the cruelty of German methods of warfare in the Balkan theatre of war.

[Surely Roumania ought to have seen enough of the war as a spectator for two years to realise the foolishness of such a protest.—Ed.]

* * *

Bukarest, Oct. 2nd.

After a week of continual trouble from above the Roumanians appeared about this date to find their feet. A report to the Italian papers hints that efficient A.A. artillery was mounted about then, and that hereafter raids by the mixed forces of the enemy will be fewer and less "healthy." The arrival of a French plane from Salonika on 1st inst. was as a cheerful omen. The populace as in other countries have been finding deadly sweets and packets of virulent microbes in odd places. The pertinacity of these reports from all quarters of the Eastern war-zone suggests that at any rate the "Kultur" of bacilli is being carried on without hindrance from our "blockade."—T. S. H.

* * *

According to a "Times" correspondent the number killed during the bombardment of Bukarest by German aeroplanes on Sept. 25th is officially reported to be 60. The streets were crowded at the time of the attack.

BULGARIA.

OFFICIAL COMMUNIQUÉS.

Oct. 1st.—In the region of the village of Beybunar an enemy aeroplane was shot down. Both aviators were saved.

Oct. 5th.—Our seaplanes attacked with great success an enemy seaplane shed on Tashavlu Lake, north of Constantza.

Oct. 6th.—On the Black Sea coast our seaplanes attacked an enemy war vessel off Mangalia and forced it by dropping bombs to beat a hasty retreat.

* * *

It is reported that bombs were successfully dropped on Sofia by two French aeroplanes, which landed at Bukarest about Oct. 6th. One of the machines went up from Corovitch, on the Monastir front, and the other from Salonika.

BELGIUM.

The "Echo Belge" reports from Brussels that during the last raid by Allied aviators 22 Belgians were killed and 30 wounded, solely because the Germans regulated their guns in such a manner that the shells exploded when they touched the ground.

* * *

The "Echo Belge" (Amsterdam, Sept. 28th) reports that during the recent air raids on the aerodrome at Saint Denis several German aviators were killed. The number of aeroplanes destroyed during the week has increased to twelve, the majority by bombs which were dropped on the principal sheds.

HOLLAND.

Fishermen who arrived at Eshjerg on Oct. 4th reported that at midday on Oct. 2nd they sighted a partly submerged Zeppelin about 35 miles north-west of List, on the Island of Sylt.

The airship was surrounded by German torpedo-boat destroyers, and two larger vessels were on either side of the envelope attempting to keep the airship afloat.

* * *

It is reported from Amsterdam (Oct. 4th) that a Zeppelin passed over Friesland on the morning of Oct. 2nd in an unsteady and battered condition, evidently suffering from its nocturnal adventure.

TURKEY.

OFFICIAL COMMUNIQUÉS.

Oct. 3rd.—Three enemy aeroplanes which, on Oct. 2nd, flew over El Arish and attempted to drop bombs were forced by our fire to beat a retreat. One machine was damaged.

Oct. 5th.—On Sept. 24th one of our aviators shot down a British machine on the Felahieh front (on the Tigris).

MESOPOTAMIA.

A "Daily Telegraph" correspondent says:—

Recent operations have been confined to air raids and a bombardment of the enemy's trenches. On the night of the 19th one of our aeroplanes raided an enemy aerodrome at Shumran, dropping eight 20-pound bombs, which fell all round a machine, apparently damaging the same, and putting out lanterns left on the ground by the guard, who fled on the aviator's approach.

Early in the morning of the 26th two of our aeroplanes successfully bombed a hangar, descending to 100 ft. One of our machines was damaged. A bullet cut a control wire, and the aeroplane "nose-dipped" 1,000 yards, but the pilot succeeded in righting the machine and landed safely. The Turks, believing they had destroyed the machine, started cheering in the trenches. Several exposed themselves, and were picked off by our snipers.

An enemy Fokker, which was reported as probably destroyed by our artillery after being brought down by an aviator, has not been up again.

GREECE.

It is reported unofficially from Salonika that on Oct. 4th British aeroplanes dropped bombs on the station of Prosenik, which was being used as a dumping station by the enemy. Much damage was caused to a train.

The following account of the sensational landing of a French bombarding aeroplane containing two aviators is published by the "Echo de Paris" from a sous-lieutenant fighting in the Doiran district. A piece of bursting shrapnel having severed one of the control wires of the aeroplane, he says, the machine began to dive head-foremost and was apparently lost. It was falling within the enemy's lines, to the great delight of the Bulgarians.

When within a hundred yards of the ground the observer managed to leave his seat, and succeeded in hoisting himself on to the upper plane of his machine, where, lying on the canvas, he was able to restore the balance of the machine by moving the plane by hand. The motor controls were undamaged, and as soon as the equilibrium of the aeroplane was restored it was able to return to the Allied lines and land without further mishap, with a bomb still on board.

Meanwhile, the observer was perched on the top of the aeroplane. The Bulgars were so dumbfounded by his daring conduct that it did not occur to them to open fire, which probably would have brought down the two heroes.

[Further details are desirable before believing this story.—Ed.]

U.S.A.

Schedule 39 presenting the terms of bid for supplies for the U.S. Navy, covering three, six, nine and twelve aeroplanes, was issued on August 28th from the office of Rear-Admiral W. S. Benson.

The machines required are two-seater tractor biplane seaplanes of the following performance:—

Maximum Speed.—Not less than 52.1 knots (60 miles per hour) nor more than 60.7 knots (70 miles per hour).

Minimum Speed.—Not more than 34.7 knots (40 m.p.h.)

Climb.—Two thousand five hundred feet in first 10 minutes from surface.

Getaway.—Not over 34.7 knots (40 miles per hour).

Landing.—Not over 34.7 knots (40 miles per hour).

Radius.—Four hours, full power.

Fly in wind of 30.4 knots (35 miles per hour).

Drift in wind of 21.7 knots (25 miles per hour).

Getaway and land in wind of 21.7 knots (25 miles per hour).

Among the details laid down in the specification are the following:—

Improvements developing between the dates of the contract and the completion of the machine shall be incorporated in the machine, if approved by the department, which shall determine finally the change of cost under the contract, if any is involved.

In the same manner any other changes or alterations ordered by the department after signing of the contract shall be considered and the change in cost determined.

Duplicate control leads are required to ailerons and rudders. The duplicate leads to follow as nearly as practicable different lines from those of the principal leads.

Means for hoisting shall be provided in the form of a fixed eye for a shackle over the top plane, and as nearly over the centre of gravity when afloat as is practicable. The means of attachment shall be thorough and permanent and distribute the load to suitable members.

POWER PLANT.—To be suited to the requirements of the machine and to be provided with self-starters so fitted and installed that the motor may be started from the pilot's seat.

The carburettors shall be provided with a means for heating and with a successful means for muffling to prevent fire in case of a blowback for the engine. Provision shall also be made to prevent any danger in case of fire should the machine turn upside down.

Double independent ignition and double magnetos shall be used.

The motor shall be protected from moisture and spray.

The ignition and auxiliary circuits must be thoroughly protected from short circuits from spray, to ensure against failure of the motor from this source. Aluminium parts are to be given protection against the effects of salt water.

All oil piping to be annealed.

The gas leads to reserve tanks, the control leads and the carburettor adjusting rod shall be provided with suitable and safe and ready couplings where these have to be frequently broken.

A positive means of cutting off the gas (i.e. petrol) at the service tank shall be readily accessible from either seat.

At least one reliable method of stopping the motor shall be provided, to be operated from either seat.

Fuel tank capacity for at least four hours' flying at full power shall be provided. Fuel tanks are to stand an internal pressure of five pounds per square inch and shall be divided by swash-plate bulkheads. The heads of the tanks are to be so formed as to prevent crystallisation due to vibration.

The service feed tank shall have a capacity for at least one-half an hour's flight, and shall be so fitted as to prevent danger from fire in case the machine should turn upside down.

The propellers shall be suited to the requirements of the motor and machine, and their efficiency should exceed 70 per cent. They should be efficiently protected from the action of spray and broken water. The hub face plates shall be thoroughly interconnected independently of the propeller bolts. A safety fitting shall be provided, so that in case the propeller bolts carry away, the propeller cannot come off the hub.

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THE INVASIONS OF ENGLAND.

The crew of the Zeppelin which was brought down near Potter's Bar on the night of Oct. 1st were buried on Oct. 5th in the small cemetery just outside the village, near the graves of the crew of the airship wrecked at Cusiley a month before.

The R.F.C. had charge of the arrangements, and a large force of police and special constables attended, but there were few other spectators beyond a little crowd of villagers.

The body of the officer who commanded the airship was enclosed in a coffin of Japanese ash, covered by a black pall. On the coffin was a plate with the following inscription, which gives the first official intimation of the officer's identity:—

Commander Mathy.

Died on service, Oct. 1, 1916.

The other bodies were in similar coffins without palls, and were buried in one large grave. The officer's body was placed in a separate grave close by. At the graveside the funeral service was read by the vicar of the parish, assisted by an Army chaplain. During the interment an aeroplane flew overhead in salute to dead but respected foes.

Commander Mathy had raided London at least once before. In September last year, in an interview with Herr Karl von Wiegand, of the "New York World," he gave a graphic, if somewhat imaginative, description of a raid on the City. He stated that he had taken part in every Zeppelin attack on England up to that time, and had already made 100 voyages in the air.

In the course of the interview Commander Mathy was asked if he had encountered any aeroplanes while over England, and he said to Herr von Wiegand:—

"I have never experienced a fight with an aeroplane, in fact, I have never been bothered by them. The men are always at the guns watching for them, but so far none have attempted to attack. We are pretty well prepared for them. I am not afraid of them, and think I could make it interesting for them, unless perhaps there was a regular swarm. As to an aeroplane corps for the defence of London, it must be remembered that it takes some time for an aeroplane to screw itself up as high as a Zeppelin, and by the time it gets there the airship would be gone; then, too, it is most difficult for an aeroplane to land at night, while a Zeppelin can stay up all night, and longer if need be."

Probably the gallant officer has by now altered his views, and one hopes that his fate may serve as a warning to his brother officers.

* * *

The exhibition of airship relics at the H.A.C. grounds, Finsbury, will be open until Saturday, Oct. 14th, from 8 to 5 daily.

* * *

Before an Essex Bench on Oct. 4th, Jack Lewis, postcard vendor, and Edward Stradling, an innkeeper, were charged under the Defence of the Realm Act with being in possession of fragments of a wrecked Zeppelin, and neglecting to report the same to the authorities. Lewis had been in custody for a week. A constable said he saw Lewis selling relics of the Zeppelin at 1s. 6d. apiece, and while he was watching him Stradling came up with a large bag of aluminium. He arrested Lewis under the Defence of the Realm Act, but Stradling got away on his motor bicycle. Both defendants pleaded guilty and expressed regret.

The chairman said that in the circumstances the two cases would be dismissed, but it was regrettable that, considering the great danger to their lives the inhabitants had just passed through, certain persons should endeavour to make money in this way.

Six other defendants appeared on similar charges, and fines were imposed varying from 2s. 6d. to £1. During the hearing some interesting relics, which had been appropriated, were exhibited.

Stradling deposited £2 in the poor-box. One defendant had sold a valuable piece of the wreck, but had gone to some trouble and succeeded in recovering it.

* * *

The following humorous account of a Zeppelin raid on England is from "Kladderadatch," the German "Punch." The humour must seem a trifle strained to the German mind after the loss of four airships in a month:—

"English War Office communiqué":—

Another successful Zeppelin raid was carried out yesterday over our city. A bomb dropped by an airship caused a deep hole to be made in a plot of vacant land on which building operations are shortly to be started. The enemy, therefore, rendered an appreciable service to the builders in preparing the ground for laying the foundations of the new edifices.

An old dilapidated building which had been condemned and was shortly to be broken up, was destroyed. The value of the work thus accomplished is estimated at £500.

On the other hand, we have, unfortunately, to lament the smashing of a window pane, at another point. It is hoped, however, that the fragments may still be utilised. With the exception of a little girl's doll, nobody was injured.

The Zeppelin was pursued by our airmen and fired on with great violence, so much so, in fact, as to compel it to rise to a great altitude.

The following "tosh,"—there is no better name for it—appeared in a half-penny newspaper on Oct. 4th:—

"The luxurious ease of life in a Zeppelin—when you do not happen to be brought down—is illustrated in the relics placed on exhibition at the grounds of the Honourable Artillery Company, Bunhill Row.

The switchboard of slaughter shows the ease of it. There is a great marquee full of the new relics. They are portions of the Zeppelin brought down in Essex in flames. But the one that made women gasp with anger and held the big, slow-moving crowd until the policeman had to speed them on for others to see the Thing, was the bomb-throwing switchboard.

All that the operator has to do is to sit before this delicately-made switchboard, watch for a town where the peaceful inhabitants are sleeping, touch a tiny polished key with his finger, and a devastating bomb is released on its errand of death.

This highly-civilised destruction-board is a plate of metal, dull silver in colour, made of aluminium alloy, and measuring about two feet by one. In three rows there stick out twenty-four little keys—small, smooth switches like well-polished metal fingers. Pressure on one of them sends a swift electric current along one of the wires that run out from behind the switchboard in a big bunch. The electric current instantly depresses a hook that carries a bomb, and down goes the death-dealer to the world below."

The attempts of the average half-penny paper to pander to what it imagines to be the taste of that peculiar portion of the population who read it would be pitiful were they not an insult to the better traditions of the British Race. To speak of a raid to England as "luxurious ease" when one takes into consideration the long voyage in the dark across a sea strewn with patrol vessels armed with powerful anti-aircraft guns and searchlights, steering by dead reckoning and the clemency of Providence, the journey inland harassed by anti-aircraft guns and by aeroplanes carrying all manner of frightfulness, and the final arrival over some sort of objective where the crew is blinded by searchlights, form together an experience sufficient to wreck the strongest nerves.

Of course every effort must be made to stamp out the Zeppelin pest root and branch, but it is depreciable of the prowess of the officers of the R.F.C. to suggest that they are merely removing the Huns from an aerial bed of roses.

So far as the perpetrator of the article on luxurious ease is concerned, one sincerely hopes that, if and when British aeronautical leviathans raid German towns on a large scale, he will be officially invited to accompany the expedition as press representative. Should he be brave enough to accept the invitation he would probably return (with luck) to terra firma a chastened and a better man for the salutary effects of the experience.

THE R.N.A.S. COMFORTS FUND.

The following donations have been received for the Fund from Sept. 4th to Oct. 10th, 1916, by Mrs. Sueter, at The Howe, Watlington, Oxon.

Oct. 6th, Mr. Eric Clift, £5;

Oct. 8th, Sunbeam Motor Car Co., Ltd., £20;

Oct. 8th, Mrs. Sueter, £10;

Total to date, £1,953 6s. 7d.

Two cases of comforts have been sent this week to No. 5 Squadron, somewhere in France, and a consignment was sent to the "Ben-my-Chree" during the previous week.

THE ACTIVITIES OF THE AERONAUTICAL INSTITUTE.

With reference to the recent article on "The Curious Activities of the Aeronautical Institute," THE AEROPLANE is informed that Major ap Ellis, R.F.C., whose name appears in the circular issued by the aforesaid "Institute" as a supporter of that concern, has resigned from it, and is not connected in any way with that organisation.

It would be interesting to know how many more gentlemen whose names are still used as bait by the "Institute" have also severed their connection with it on learning more about it.

AN EXPURGATED EDITION.

Prebendary Carlile recently told the following amusing story of the fate of a Church Army hut at the front:—

"One of our men invited a whole battalion to dinner and borrowed crockery amounting to some 500 plates for the purpose. While they were in the midst of the festivities an enemy aeroplane came over and all the men were ordered out. Within a few minutes of their leaving, a shell directed by the aeroplane fell on the hut, and hut and plates were things of the past."

[The Padre unfortunately forgot to relate what the owners of the crockery had to say about it!—Ed.]

CONGRATULATIONS.

ATKIN SWAN—HEAD.—On Sept. 28th, at St. James', Spanish Place, Charles Atkin Swan, M.B., to Veronica Head, widow of the late Walter Head.

Dr. Swan is the famous doctor through whose efforts the Royal Flying Corps Hospital at 37, Bryanston Square, has been made such a success.

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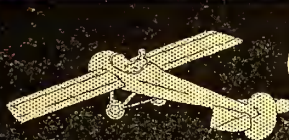
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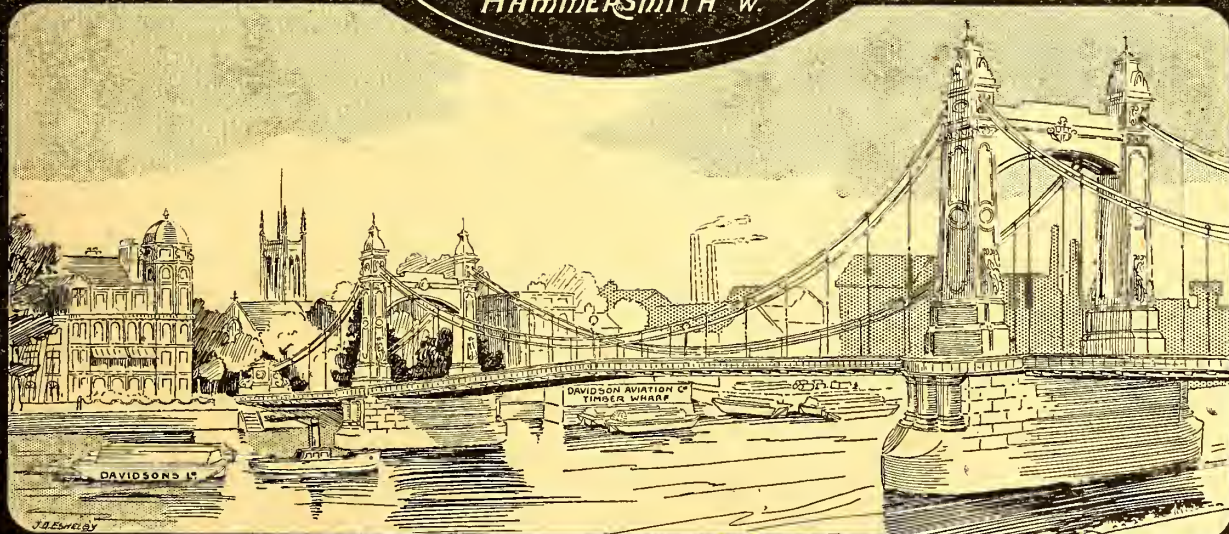


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FROM DENMARK.

The German aeronautical press containing casualty lists no more, the following names are compiled from obituary notes and other sources.—Flight-Lieut. Otto Parschau, killed by a British aeroplane in engagement on 22nd July; Captain von Geersdorf, commander of a battleplane squadron, killed; Captain Wilhelm Bloem, killed; Oberlieut. L. M. König, killed in aerial engagement on 16th July; Oberlieut. Heinrich Soyter, killed; Oberlieut. Baron von Tessin, died from his wounds; Lieut. Walter Braentigam, killed; Lieut. of the Reserve and battleplane pilot Franz Sigwart, accidentally killed in aerial fight; Lieut. Walter Sieber, killed in aerial fight; Aviator Bruno Dimke, a well-known motor-pace cycle rider, accidentally killed on a patrol flight.

* * *

Large aircraft manufacturing works have been formed under the name of "Germanische Flugzeugwerke" at Leipzig, where the resting sheds were hired at the aerodrome. At Leipzig-Heiterblick has come to rest too the Automobil-und Aviatik Co., having owing to and since the war rambled from Mühlhausen-Habsheim to Breisgau, Freiburg and now finally Leipzig.

* * *

It is reported that a young Danish ensign, named Pollner, is anxious to fly across the Atlantic next year.

The seaplane will be built in Denmark by engineers from the Polytechnic Academy, Copenhagen, and will have two motors of 160 horse-power each. The seaplane will carry a fuel supply of two and a half tons.

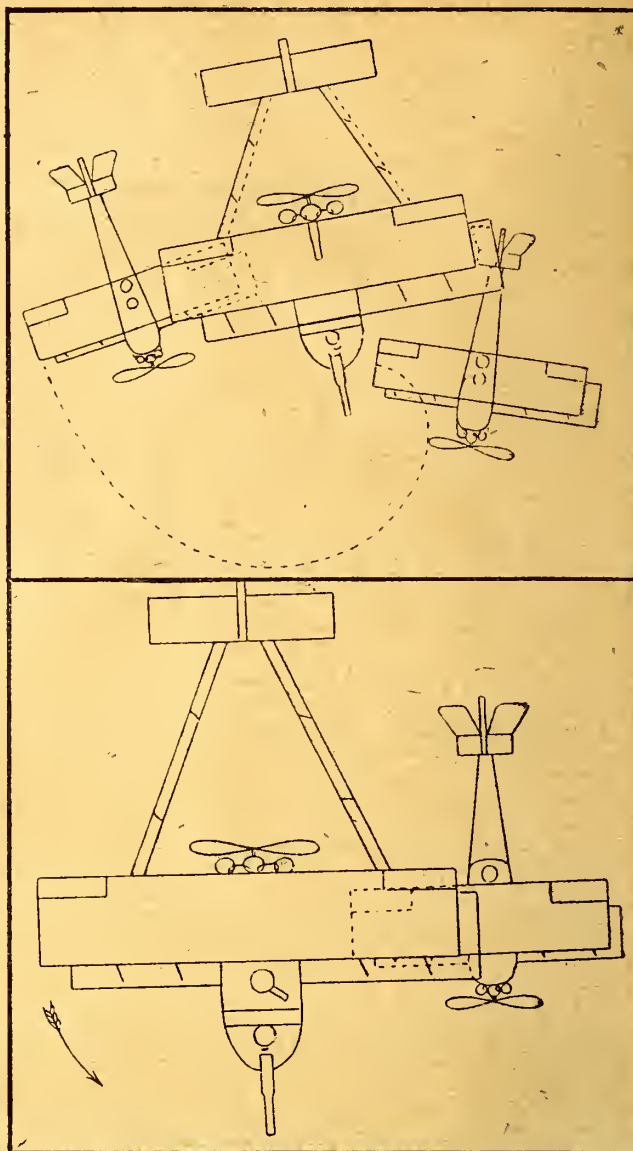
The young officer hopes to start from Copenhagen early in July, flying directly to the Faroe Islands, and waiting his chance there to take the trip across the sea. Severinsen, a mechanical engineer, will accompany Pollner, who is already busy on his preparations.

AN EXTRAORDINARY COLLISION.

There have been a number of remarkable escapes from death after collisions between aeroplanes in full flight, but an incident described by "La Vie au Grande Air" for September, 1916, seems to be about the limit in the possibilities of an escape from what seemed to be almost certain death.

The actors in this performance were Sergeants. W. and M., accompanied respectively by Mechanics G. and M. On June 18th last these aviators, who belonged to the "entrenched fortress" of Paris, were making the patrol round the city together and amusing themselves by pretending to fight one another, and carrying out the necessary manoeuvres with which to attack the Boche. Somehow or other a collision occurred at a height of 1,850 metres over the Pantin. The left wings of the Nieuport hit the right wing struts of the Voisin from behind, and the Nieuport did a complete turn round the front of the big machine, using the outer right-hand interplane struts of the Voisin as a pivot. Of course, all the time the Voisin was forging ahead, and the result was that the tail of the Nieuport slid past the left-hand cellule of the Voisin and its right-hand wings caught in the left-hand wings of the big machine and locked, as shown in the accompanying diagrams.

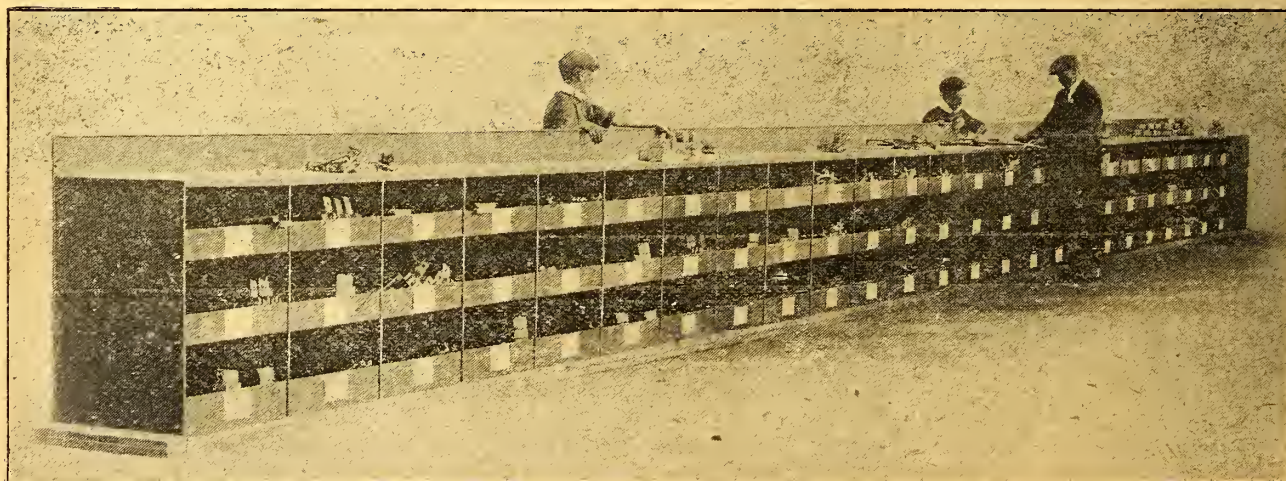
The two pilots had the presence of mind to stop their motors, and the whole outfit came down in a terrific spiral, in the words of the French journal, the Nieuport resembling a terrier playing with a mastiff. The descent took 4½ minutes, and naturally the crew had a pretty bad time of it, but they made such precautions to minimise the effect of the inevitable smash as were possible. However, they came off lucky, as the machines did not come unstuck, and they finally fell between the roof of a house and a large tree, which were sufficiently strong to prevent



Above the machines are shown in the first two positions of the collision, and below they are seen as they descended.

them falling through, and the two machines formed a sort of a bridge between the house and the tree.

One of the mechanics, evidently thinking that now he had risked his life with such impunity it did not matter whether he risked a limb or so, without waiting to be rescued from the machine by people who had gone to fetch ladders, climbed overboard, and, hanging by one of the wheels, dropped to the ground. The other three members of the crew, however, waited to be fetched out with the help of ladders.



A Useful Stores Fitting.—A combined counter and series of bins, made in sheet steel by Sankey's of Wellington, Salop.



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A NEW STYLE IN FRIGHTFULNESS.

The American monthly purveyor of general and domestic engineering, "Popular Mechanics," contains an extraordinary article on a new method of aerial attack, said to have been adopted by the Germans, which should be most interesting to officers in the Royal Naval Air Service whose duty it is to patrol the East Coast. It would be interesting to know whether any of them have ever fallen in with a craft approximating to the type described.

According to "Popular Mechanics," this new piece of Hun "frightfulness" consists of an enormous twin-engined tractor triplane flying-boat with twin tubular fuselages which meet at their junction with the tail planes.

This machine carries a couple of light guns upon the top plane, apparently quite unscreened, but the principal feature of interest is accommodation for a small aeroplane on top of the navigating cabin. This monoplane is so arranged that at any time it can be released to attack enemy aircraft, or to carry out any special bomb-dropping mission that may be desired.

It is said that the auxiliary monoplane has been launched successfully, but it is not quite clear whether it has ever been picked up again at the end of a journey, or whether it has been compelled to alight on the nearest land.

The diagrams illustrating the article suggest that the monoplane is merely held down on the roof of the body by ropes attached to four cleats, but undoubtedly some more ingenious system than this has been devised.

Nevertheless, the whole scheme is clumsy and unpractical and far from characteristic of the efficient way in which things are usually done in Germany. It would be so much simpler to design and construct a large fighting aeroplane with sufficient climb and speed to take on any sort of enemy aircraft.

Carting a subsidiary aeroplane about in this way seems about as sensible as carrying a Baby Peugeot on davits over the stern of a Rolls-Royce, or the ancient idea of the Royal Navy that the

proper way to carry a torpedo-boat was on board a battle-ship. The production of sea-going destroyers soon put an end to the transported T.B., and the production of a high-powered seaplane which actually flies ought to nip the parasitic pup-plane in the bud.

If it is possible to build battleships with a destroyer performance, it ought to be possible to build big seaplanes with a scout performance. So, unless the R.N.A.S. is asleep, it ought to make very small beer of this new Hun frightfulness.

A FINE CREED.

"Of two things one is certain: either you're mobilised or you're not mobilised. If you're not mobilised, there is no need to worry; if you are mobilised, of two things one is certain: either you're behind the lines or you're on the front. If you're behind the lines there is no need to worry; if you're on the front, of two things one is certain: either you're resting in a safe place or you're exposed to danger.

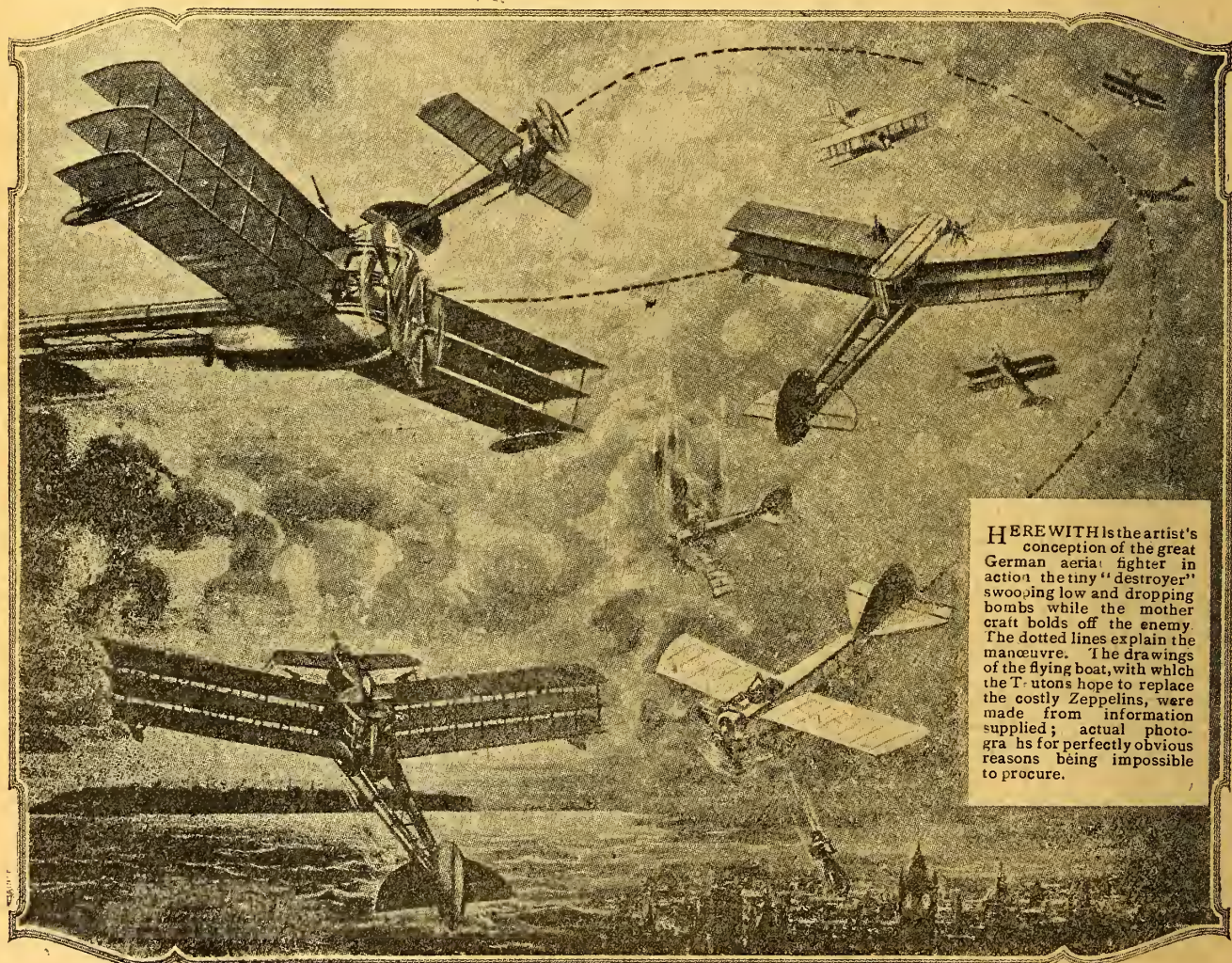
"If you're resting in a safe place there is no need to worry; if you're exposed to danger, of two things one is certain: either you're wounded or you're not wounded. If you're not wounded there is no need to worry; if you are wounded, of two things one is certain: either you're wounded seriously or you're wounded slightly.

"If you're wounded slightly there is no need to worry; if you're wounded seriously, of two things one is certain: either you recover or you die. If you recover there is no need to worry; if you die you can't worry."

This is the Litany of the Poilu, as set forth by Miss Kathleen Burke, who is writing in "Land and Water" a series of articles descriptive of her visit to the French front. Its serene philosophy interprets as well as words can do the spirit of France.

MANAGERS WANTED.

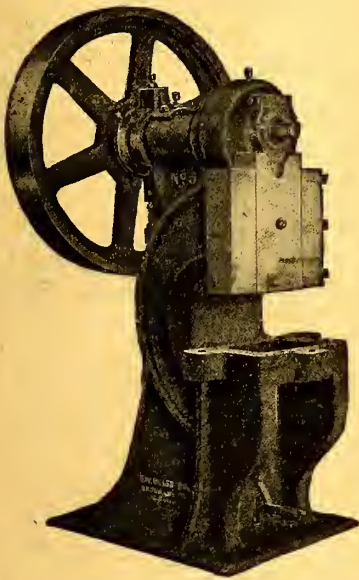
Any works managers or draughtsmen designers who want jobs are advised to write to the Editor of THE AEROPLANE.



HEREWITH is the artist's conception of the great German aerial fighter in action: the tiny "destroyer" swooping low and dropping bombs while the mother craft holds off the enemy. The dotted lines explain the manoeuvre. The drawings of the flying boat, with which the T-utons hope to replace the costly Zeppelins, were made from information supplied; actual photographs for perfectly obvious reasons being impossible to procure.

Reproduced from "Popular Mechanics," New York.

A Comic German-American idea for a huge seaplane with a parasitic machine on top. "Popular Mechanics" says:—"So far as is known, the machine has not yet been sufficiently developed to warrant its actual use for war purposes. A few weeks ago it was still being worked upon by aeronautical engineers. In actual tests the machine has not only gotten away without difficulty, but the swift auxiliary craft has been successfully launched during full flight in mid-air."



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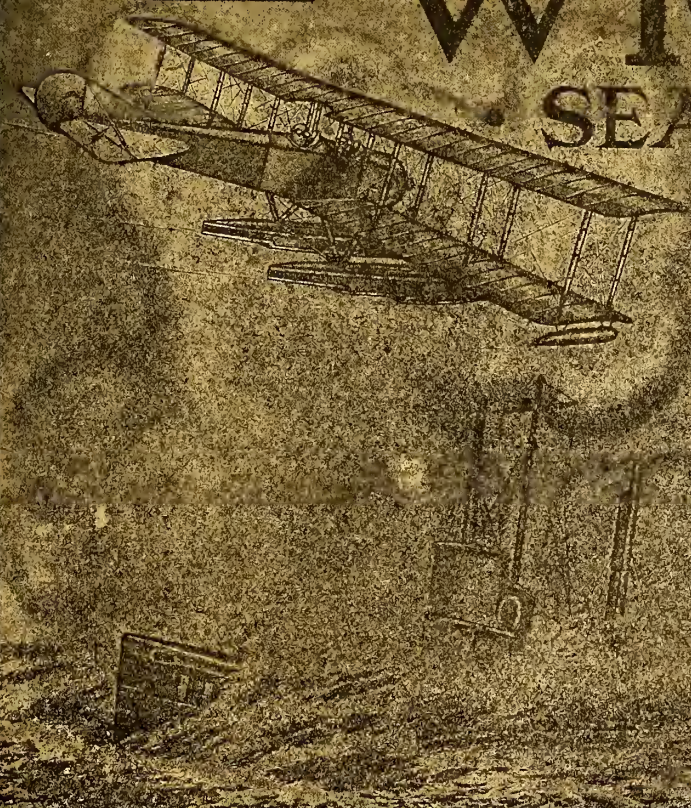
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ERNEST B. H. LONDON, ILL.

DE PROFUNDIS.

"By Babylon's fair watercourse we sat us down and wept"—
So mourned the psalmist, and 'tis thus I sing—though no adept.

My harp resounds a minor key, and many a strange hiatus
Is caused by sobs that rise and choke my breathing apparatus.

"My friends and lovers stand afar:" thus David did commune.
And so do mine, *they've all seen Zepps (tranquillo)* I'm immune!

I never use (*prestissimo*) to seek a lower room
As while an airship (*agitato*) crashes to its doom.

Downstairs I ne'er (*staccato*) skip to join a concourse flighty.
Clothed in a dressing-gown that shrouds a (*pianissimo*) "nightie."

'Tis not for me 'gainst window-pane to thrust inquiring nozzle.
(*Con sentimento*) while aloft our "airmen" Zepps spikebozzle.

What can I do (*con anima*) my spirits to elate,
How warble (*dolce*) songs of praise instead of hymns of hate?

I know (*crescendo*) what I'll do! I'll loop! 'Twill be my boast
I've beaten all the braggarts at the (*fortissimo*) post!

(I suppose I shall *some* day, but "hope deferred maketh the
heart sick"!)

F. E. B.

CONGRATULATIONS.

LANG—KUHNE.—On Oct. 4th, at the Chapel Royal, Savoy, by the Rev. S. Millar Hagerty, Assistant Chaplain, Arthur Alexander Dashwood, younger son of Charles Augustus Lang, of The Shiel, Weybridge, to Emily Florence Rachel, youngest daughter of Mrs. Kuhne, of Casa Cara, Weybridge.

Mr. Lang is one of the best-known men in the aircraft industry, and all will wish him and his bride long life and happiness.

In the earliest days of aviation Mr. Lang, who had for years made a hobby of wood-working, began to study the design and construction of air-screws, and made a large number of experiments at his own expense. Later he joined the Bristol Co. as propeller designer, and did much very valuable work both on the scientific and practical sides of this branch of the industry. Not long before the war he started what he was pleased to call a "wind-stick" factory at Weybridge, and since then his business has been a uniform success. And because he is himself no one has ever begrudged him his success.

Socially Mr. Lang is as successful as he is commercially and industrially. A humorist of the first class, a talented singer and dancer, he might have been an immense success on the stage,—in fact one believes that his adventurous and varied career includes certain theatrical experience. However, his friends have the benefit of the entertainment which is lost to the vulgar herd, and his humours are thereby the more priceless. One can only hope that the future life of Mr. and Mrs. Lang may be as successful as the Lang firm and as merry as the Lang humour.—C. G. G.

STAFF NERVES AND STAFF CARS.

The following letter has been received from a lady who seems very well able to uphold the skill and nerve of her sex:—

"You horrid man! I don't think you really deserve a letter from anybody nice because of your horrible attack on women drivers! I know we can't all be so beautiful and divine as 'Lovely Man,' but the Lord preserve me from the MALE—Yes! M-A-L-E MALE motor drivers one meets on the roads. This neighbourhood simply abounds with ROAD HOGS of the deepest dye, and they ARE hogs, too! Just because a man (?) puts on disreputable-looking clothes, and lounges round the Aerodrome, with a peaked cap reminiscent of the Music Hall stage, it's no blankety blank reason why that man should tear round corners at about 60 miles per hour ON THE WRONG SIDE OF THE ROAD, MIND YOU, when on terra firma.

"I admit some women, new to the game, are rather forgetful about signalling their intention to stop, or are apt suddenly to deviate from the correct course; but you can take it from me to every thoughtless female driver there are 1,001 male motorists.

"Who are the creatures who make the roads unbearable? MEN!! Who are the motor drivers who invariably come round dangerous corners on the *wrong* side? MEN! Who is it imagines the whole, and nothing less than the whole, road (and pavement) belongs to him? MAN! Yes!—with VERY FEW EXCEPTIONS—you are absolutely horrible on the road, and not even fit to handle a *toy* motor—let alone the real thing!

"I have driven officers of the R.F.C. on several occasions, and I can assure you they have none of them suffered the ghastly horrors you *imagined* your officers suffered in that pretty little fairy story you wrote in one of your recent issues, and I don't pretend to be anything more than a very ordinary driver, but, then, you see, I haven't had a pretty uniform given me.

"Perhaps the gears *were* rather tiresome on the change—some cars do (I believe) suffer from this complaint, but you mustn't forget that even MEN make a very horrible noise with their cars *sometimes*—and have been driving themselves for years. Ask my husband his opinion—and he will tell you that I drive so well that he can't be bothered to become an expert himself! However, I shan't certainly offer you even so much as a lift if that's your opinion of my sex. Nasty man!"

FOR PRISONERS OF WAR.

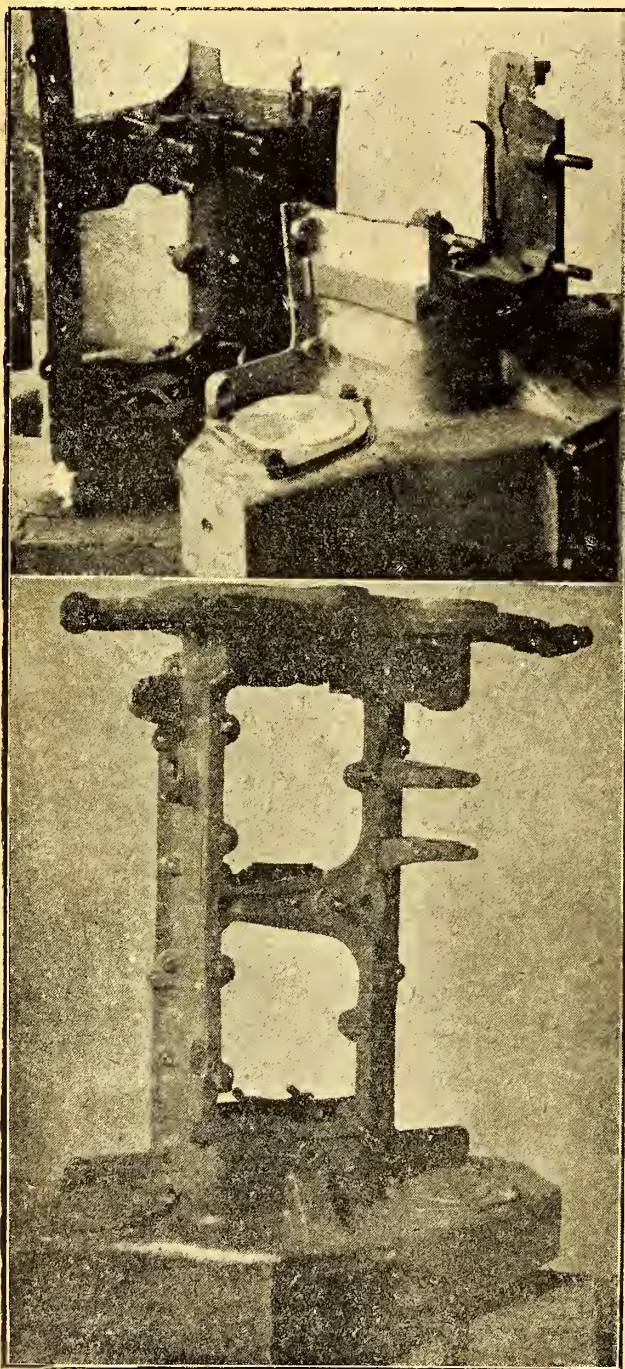
The following amounts have been received during the week ending Oct. 4th for Muriel Countess Helmsley's and Mrs. Rowton's Fund for Prisoners of War in Germany:—From the employees of Vickers, Ltd., Weybridge Works, £7 3s. 6d.; from the employees of Vickers, Ltd., Bexley Heath Works, £3 9s. 3d.

ON WELDING.

After having received so many testimonies to the excellence of the oxy-acetylene welding, and work of a similar nature, carried out by Barimar, Ltd., whose works are in Lamb's Conduit street, W.C., it was a matter of great interest to go and see some of the work being done. Acetylene welding is always a fascinating operation to watch, but like most other things that are of use in this world it can either just be done somehow or carried out as a fine art. There is no doubt under which category the Barimar process comes.

Mr. Lamplough, the works manager of the concern, recently took the writer round the works and showed him repairs being made to articles which one would imagine to be doomed to the scrap-heap.

One of the simplest jobs that was being carried out was the



An Example of Barimar Welding—Above, the pieces of the wrecked crank-case are seen. Below is the finished job.

SAGE Aircraft

"Britannia's Pigeons"

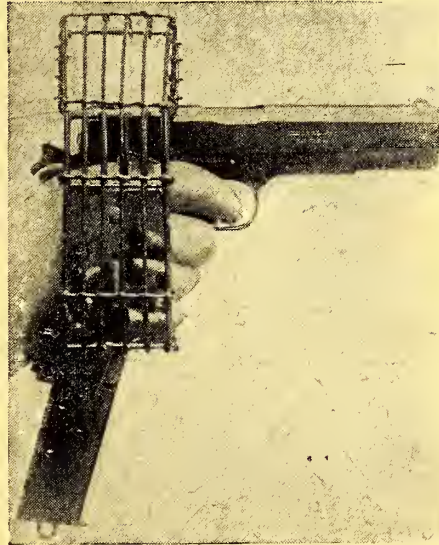
SAGE Aircraft is leading the way.
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more masterly workmanship are
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The "RFC" Pistol Cartridge Case Deflector

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PRICE

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Easily
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This contrivance has been devised for the purpose of catching and holding the fired empty Cartridge Cases when ejected from Automatic Pistols, preventing the Cases from falling on and damaging the various parts of Aircraft.

The Cases are all caught in the wire Cage, which can be emptied at any convenient time by simply releasing the hinged door at the bottom of Cage

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welding up of a large piece of cast-iron which had been knocked out of the lower part of a motor-cycle engine. This piece was built into the rest of the cylinder in a very few minutes, and it only required a certain amount of machining and filing up to bring it back to its original condition.

The works were full of jobs in hand of every conceivable kind. Crank-cases of car engines which had come off second-best in collisions, or which had been smashed through the breakage of internal parts, broken crank-shafts and cam-shafts, cracked gear-boxes and differential cases were evidently considered part of the ordinary day's work.

One exceedingly difficult job that is illustrated herewith was the repair of a set of cylinders with the crank-case cast integral. It will be seen that both the crank-case and the wall of the cylinders had lumps knocked clean out of them, and yet it was possible to make a perfectly clean job of the whole outfit.

A line which Barimar, Ltd., consider a speciality is the repair of every conceivable kind of water radiator for motors, and they keep in stock an accumulation of jigs from which tubing for practically every radiator in existence can be manufactured. The work in this department ranges from curing small leaks to the absolute reconstruction of a telescoped radiator, and, where necessary, new radiators are built.

A curious order had been received on the day the writer called from a customer who wanted a simulation Rolls-Royce radiator manufactured to fit his Ford car!

Barimar, Ltd., have, of course, done a considerable amount of aviation work, and are open to receive any more that may be brought along, as their resource in manipulation is particularly adapted to this class of work.

One job with which they have been very successful has been the enlargement of a big batch of Curtiss inlet manifolds to increase the supply of gas delivered to the engine.

During the visit Mr. Lamplough asked a workman to give a small demonstration of the extreme temperature of the oxy-acetylene flame, which is a matter of 7,000 degrees. A hard steel file was eaten in halves in a few seconds, but the most convincing experiment was to take an ordinary piece of fire-brick which had been chipped off one of the heating furnaces and play the flame upon this. It very soon began to run and sizzle like so much toasted cheese, although, of course, it quickly congealed as soon as the flame was taken away.

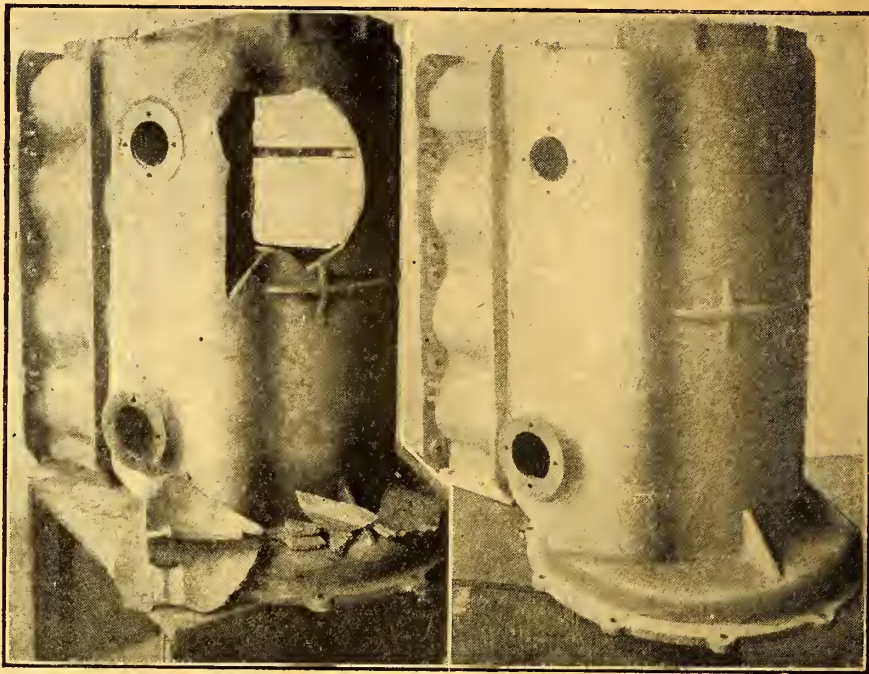
There is no doubt that Barimar, Ltd., are rendering very great service to the engineering industry at this time, because there are breakages constantly occurring in aluminium, cast-iron and steel articles, which are absolutely impossible to replace during war time, and the work they have carried out must have accelerated the production of munitions in all sorts of indirect, as well as direct, ways—for example, as regards their main line of business, the repair of motor-car parts where they have kept on the road thousands of vehicles on war service which otherwise would have had to be laid up for the duration of the war.—W. L. W.

THE CANUTE AIRPLANE.

A new aeroplane company is to be registered under the title of Canute Airplane Co., Ltd., Royal Pier Gates, Southampton. Mr. W. Chas. Holt, whose name will be familiar to many readers, will act as general manager and secretary.

The company has taken over the existing business, machinery, etc., of Moonbeams, Ltd., and their object is to construct seaplanes, land machines, fittings, etc., and to carry on and develop large contracts for parts of aeroplane engines already in hand.

One may be certain that there will be constructed by this new concern seaplanes and land machines embodying original designs, and, knowing what one does of Mr. Holt's past experience, one would not be over-sanguine in saying that one may look out for some new developments, that will possess real fighting value, in a machine constructed by this new company.



Another Example of Barimar Welding. On the left a damaged crank-case and cylinders. On the right the finished repair job.

Mr. Holt is well known at Brooklands, both on the track and in the air. He is one of the earliest motorists, having taken part in a number of races, and having won some nice prizes. He made a plucky attempt at a flight from Manchester to Reading in 1910 on a Blériot pattern monoplane, fitted with a 35-h.p. engine, and his association with the beautifully built Perry-Beadle flying-boat, which was exhibited at Olympia in 1914, led to his subsequently taking up an important position at the Twickenham factory for the development of this highly interesting design.

The firm is now in a position to accept contracts for complete machines, spares, etc., and inquiries should be addressed as above stated. Naturally, one wishes every success to the new firm.

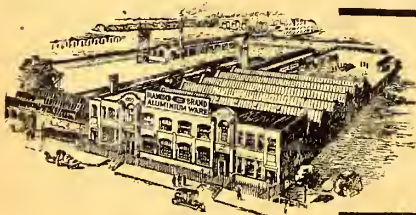
FLYING AT HENDON.

Although the weather on Saturday, Oct. 7th, was fine, it was far too windy for novices to fly, and quite sufficiently windy to make more practised hands not particularly anxious to do much in that direction. Despite this a good deal of work was done in the sheds, particularly at the Beatty school, where Mr. George W. Beatty and his assistants continue to experiment enthusiastically with the Beatty engines, which are becoming quite wonderful in the way of efficiency.

Despite the existence of the Military Service Act, and the institution of cadetships for aspirants to the R.F.C., there are still one or two curious children who wander about the enclosures at Hendon "all dressed up and with nothing to fly"! On Saturday at least one of these unhappy beings was very much in evidence, and despite the blowing of a 40-mile gale he was still hopefully strutting about in an immaculate yellow equipment of leather tunic, gauntlets, aviator's helmet and goggles which looked far too clean ever to have been in an aeroplane. If he really thought people would mistake him for an aviator he must have been sadly out in reckoning, as his appearance suggested to the ordinary eye a cross between a wingless Buff Orpington and a bad case of jaundice! The contrast between this type of enthusiast and the pukka aviator, who usually affects nothing more exciting than an old shooting jacket or a motor-cycling coat, and any kind of cap that will keep the oil out of his hair, is most striking.

A SCHOOL FOR BRADFORD.

Mr. G. H. Quaile, who was for some time a pupil at the L. and P. school at Hendon, where he took his certificate in very good form, has planned to open an aviation school at Bradford. He has secured an option on a large piece of ground in the immediate vicinity of the city. His intention is to open a school for civilians. At first sight this might seem rather difficult in



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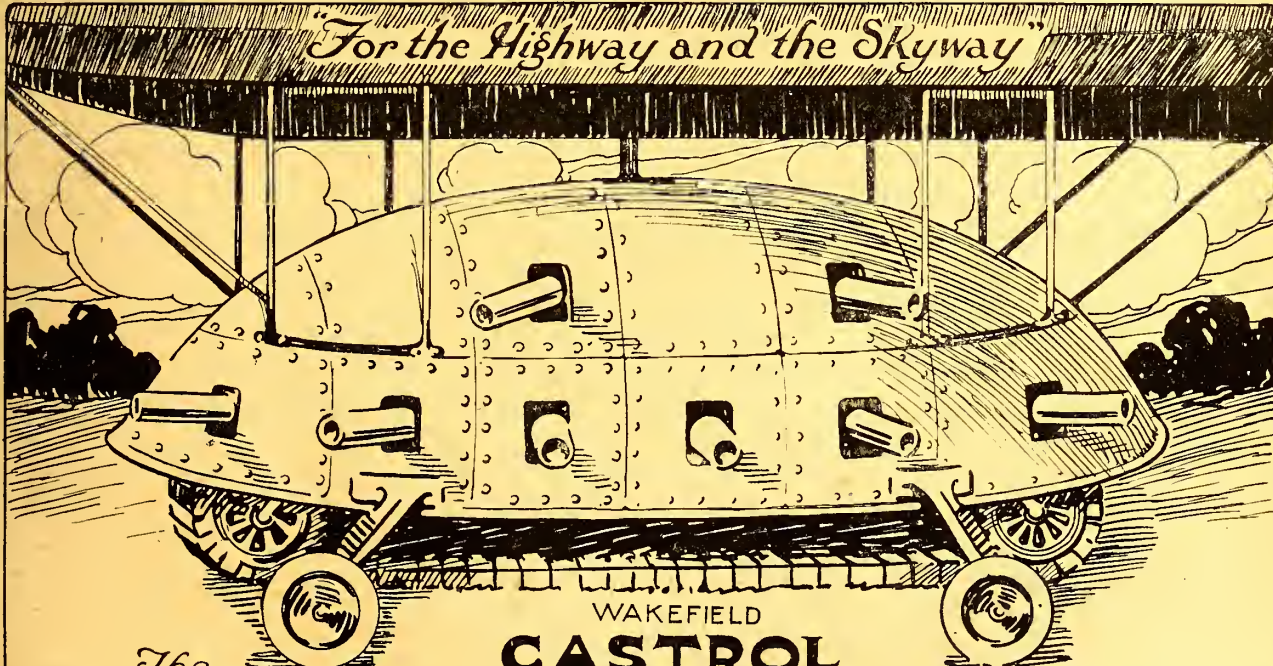
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war-time, but it must be remembered that there is an enormous number of comparatively young men who, though for medical and other reasons ineligible for the Army, can indulge in flying to a reasonable extent.

As a matter of fact, although the scheme has not gone very far past the paper stage, Mr. Quaile has received over a score of offers to join the school when it is formed, and it seems distinctly possible that a success might be made of such an institution on these lines. It is quite possible that munition workers in the vicinity of Bradford will be glad to fill in their spare time in learning to fly purely as a recreation.

Mr. Quaile is a most enthusiastic aviator and has spent quite a long time in the air. Incidentally he has been passenger in a matter of something like 300 loops in the L. and P. tractor biplane. He has succeeded in obtaining the services of one or two very useful instructors, who will join up as soon as the school is open, and the progress of the enterprise will be watched with interest.—W. L. W.

PROPELLERS OF QUALITY.

When a firm, possessing thoroughly well equipped works, thoroughly experienced hands and a thorough experience of working material, takes up the manufacture of goods of a novel type but made of familiar material, one naturally expects good results. Therefore, there is nothing surprising about the fact that the propellers made by Oddy & Co., of Mill Street, Meadow Lane, Leeds, should be highly satisfactory both as regards workmanship and finish.

Mr. Oddy himself, who is a hard-headed Yorkshire business man, went into the propeller business because he saw it was the most useful way of employing the men and machinery already in his possession, and the results quite justify his action. He does not profess to be a propeller designer, but he does profess to know how the propellers should be built, and judging from what one hears of the Oddy propellers his professions are duly carried out in performance.

The Admiralty, at any rate, thinks very highly of his work and so apparently do the pilots who have used his products.

Not long ago the writer was talking to Mr. Oddy about the question of combining out the younger men from the aircraft industry, and Mr. Oddy, although agreeing in principle with the idea of letting all the men go who are not actually skilled workers or indispensable, made rather a good point in a story concerning one of his own men. This man, who was a year or two over military age, was a first-class wood-worker in every way, but new to propeller work. He started in enthusiastically on the

job of shaping a big propeller, and when at the end of the day Mr. Oddy went to ask him how he was getting on the man remarked sorrowfully, "Well, gov'nor, I never knew before what it was to be too old at forty."

The point of the remark is that a man who is used to handling an ordinary plane and chisel finds it a very different game when he has to stretch himself to his full extent to operate the special tools used in making a big propeller, and one quite sees how for certain operations of this nature it may be absolutely necessary to keep young men for the job, for although the job itself may not call for years of training and experience it certainly demands physical fitness.

THE GENERAL AVIATION CONTRACTORS, LIMITED.

On Wednesday, Oct. 4th, a motion was heard before Mr. Justice Atkin as Vacation Judge in an action brought by Mr. D. L. Santoni against the General Aviation Contractors, Ltd., and another.

Mr. Woodgate, instructed by Messrs. Osborn and Osborn, appeared for the plaintiff, and Mr. G. W. H. Jones, instructed by Mr. F. A. Rudall, of 48, Watling Street, E.C., appeared for the defendants.

From the affidavits which were read it appeared that in pursuance of notices duly given, a resolution had been passed on Sept. 7th for the voluntary liquidation of the defendant company, and for the appointment of Mr. W. A. Casson as liquidator. These resolutions were to be confirmed at a meeting called for Oct. 6th, and the object of the action was to obtain a declaration that the original resolution was passed improperly, and for an injunction to restrain its confirmation. The affidavit of the plaintiff Santoni set out that he held a controlling share interest in the company, and that the resolution was passed whilst he was absent in Italy on the company's business.

Mr. G. W. H. Jones proceeded to read the affidavit of Mr. W. Ridley Prentice on behalf of the company, in which it was denied that any irregularity had taken place, when the judge stopped him, and stated that he had read sufficient of the affidavit for the purposes of the motion.

Mr. Jones then stated that the object of the liquidation was to obtain an order of the Court for the examination of the plaintiff Santoni, as allegations were made against him as to the manner in which he had dealt with certain assets of the company in the form of shares in the Societa Anonima Costruzione Aeronautiche Savoia and Agenzia Generale Forniture Aeronautiche Companies.

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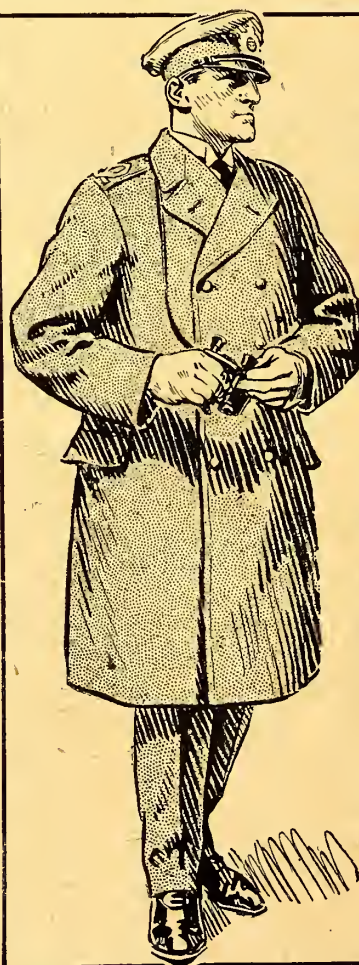
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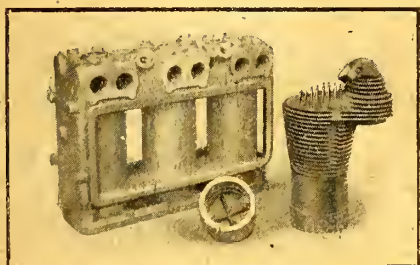
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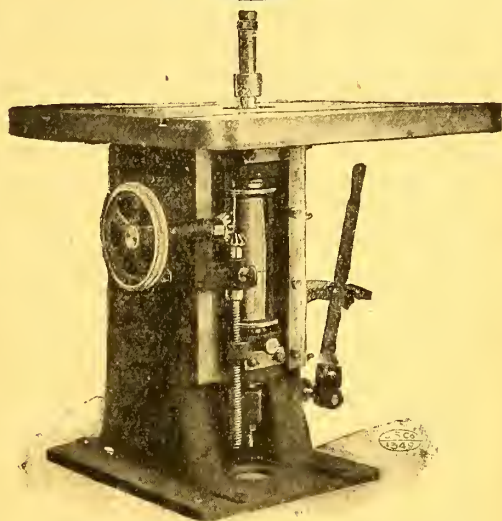


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Without calling upon counsel for the plaintiff the judge said that he would make no order on the motion. The application for the injunction, therefore, failed.

At a meeting of shareholders of the General Aviation Contractors, Ltd., on Friday, Oct. 6th, a resolution was confirmed to put the General Aviation Contractors into voluntary liquidation, and to appoint Mr. W. A. Casson liquidator.

It was stated at the meeting that an unsuccessful attempt had been made by Mr. D. L. Santoni to obtain an injunction against the company to prevent the passing of the resolution for liquidation.

We understand that all the creditors, of whom there are very few, will be paid in full, and that the principal object of the liquidation is to follow up proceedings against Mr. Santoni in certain actions which have been begun, the writs for which have already been served on Mr. Santoni during his recent visit to England in connection with the above abortive legal proceedings.

"SHELL" MOTOR SPIRIT.

In order that all interested may be informed sufficiently in advance of the new situation respecting "Shell" motor spirit, a preliminary notification has been issued stating that at the end of the present year the British Petroleum Company's contract as distributing agents will expire, and the handling of "Shell" will be taken over as from January 1st next by the "Shell" Marketing Company, Ltd.

As is generally known, the British Petroleum Company, Ltd., is not, and never has been, connected directly or indirectly with the "Shell" interests apart from their appointment as distributing agents upon commission terms. The "Shell" Marketing Company, Ltd., on the other hand, is established and controlled by "Shell" Royal Dutch interests, and will, consequently, enjoy all the advantages of the vast resources of the parent companies, with their own fields of production and refineries practically encircling the earth, their extensive fleet of tank steamers, their great financial strength, and almost unlimited resources. The significance of this great strength of the source of supply will be readily appreciated by commercial users of motor spirit, who realise that—particularly under war conditions, when they are compelled to rely upon themselves rather than upon the railways—they need the utmost protection for the motor traction which they have brought into use for the delivery of their goods, and they are now making their arrangements with the "Shell" Marketing Company to ensure their 1917 supplies of motor spirit.

The "Shell" Marketing Company has been formed with the express purpose of placing the marketing of "Shell" motor spirit and other "Shell" petroleum products upon a basis of the highest efficiency. All that the parent companies' unparalleled experience has taught them in the direction of service efficiency has been brought into the organisation of the new concern. The company's 500 motor spirit depots now form a network amply covering the entire Kingdom. The motor delivery fleet has been considerably augmented. Excellently appointed divisional offices have been established in all the great centres. An exceptional standard has been set in respect of the staff, every unit of which is expected at all times to make the customers' interests his special concern. Provision has been made for members of the selling staff to wait upon customers regularly and frequently; and most of our friends have already been called upon.

Never in the history of "Shell" has there been a time when it has been less necessary than now to refer to the supreme quality of the spirit, for not only has each succeeding year enhanced a reputation that has ever been unimpeachable, but the highly important part which "Shell" has played in the present war has brought it into unexampled prominence. No inconsiderable part of the Allies' air supremacy is attributable to the incomparable quality of the "Shell" spirit supplied.

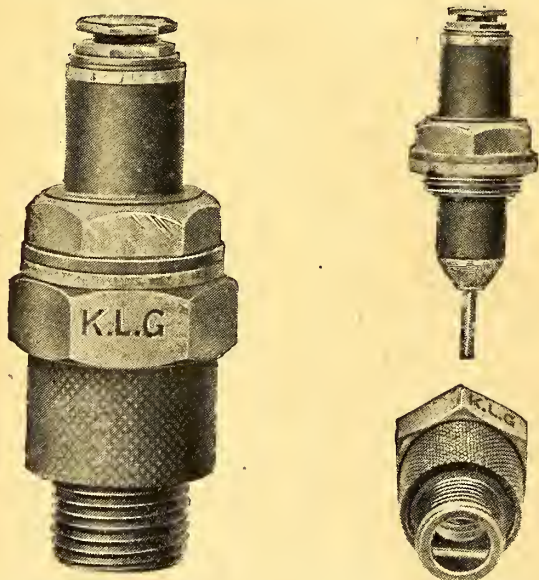
From the outbreak of war the "Shell" Company has devoted its utmost endeavours to serving the Government and our Allies by assuring them a constant supply of the very finest petrol the world produces, placing entirely at their disposal its resources in the whole of the British Empire. Notwithstanding this, and the commandeering of numbers of its tank steamers, the company has faithfully carried out its general contracts, and has taken every measure that conditions have admitted of towards caring for the interests of all users of "Shell" motor spirit.

It is the determination of the "Shell" Marketing Company to maintain under all conditions the same high principles of service which have created for its parent companies a reputation that is honoured wherever the British language is spoken, and which has, during the present war, established this great petroleum enterprise as a National asset.

All will be glad to hear that Mr. John Cates, who has so long and so successfully represented the British Petroleum Co. among motorists and aviators, will be connected with the "Shell" Marketing Co., Ltd.

The correct title and address of the new firm is the "Shell" Marketing Company, Ltd., Empire House, Kingsway, London, W.C.

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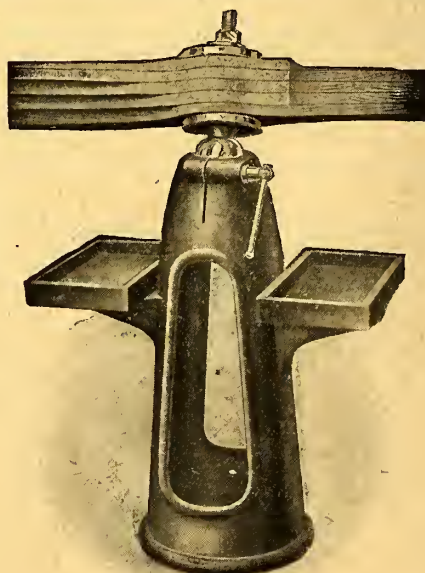
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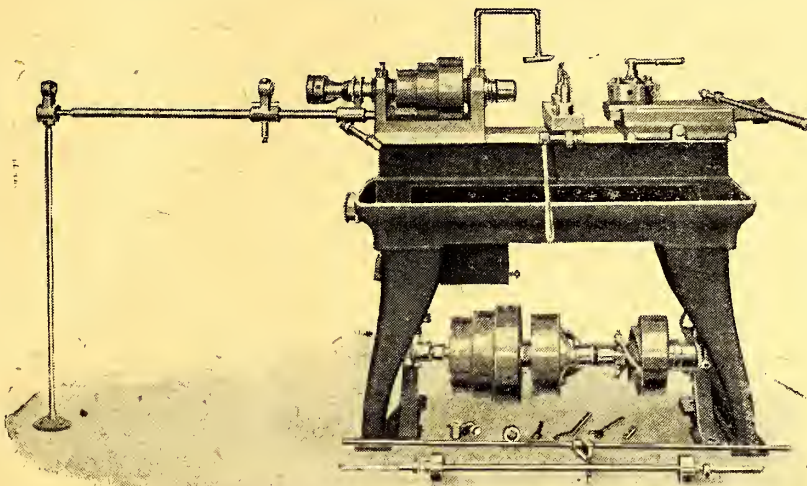
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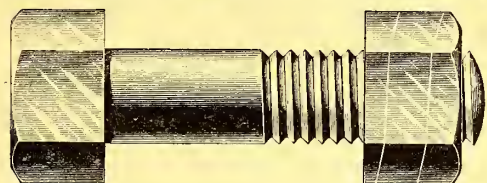
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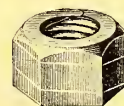
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On Testing Machines.

Now that the construction of aircraft is becoming a real industry it behoves the proprietors of modern aircraft factories to install machines of the class usually called "non-productive." Such machines are only non-productive in that they do not turn out parts used in the building of aircraft. But just as an experienced "costs clerk" or an able financial assistant is necessary to the commercial success of a manufacturing concern, though he does not "produce" letters and invoices in the way the productive staff of an office does, so testing machines are necessary in an up-to-date establishment.

By such means alone can the constructor assure himself that batches of material delivered to him are up to the standard of quality required, and so insure himself against having quantities of his finished products returned to him, with consequent loss of time and money, not to speak of a ruined reputation. And, be it noted, in no industry does so much depend on a firm's reputation for absolute reliability in material.

It is therefore well worth the while of aircraft manufacturers to study the various testing machines now being produced. Some of these are specially designed for aircraft work, and others which have been designed for other work are peculiarly applicable to aircraft material.

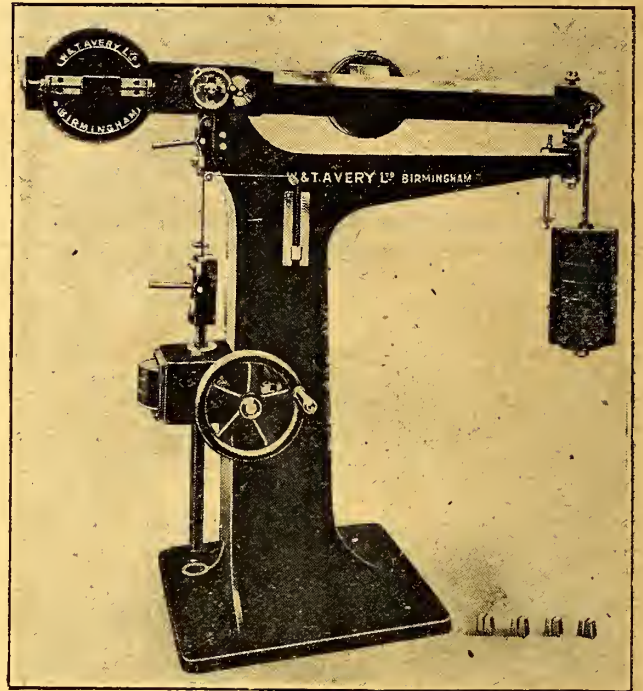
For the following notes and illustrations of these special machines this paper is indebted to W. and T. Avery and Co., Ltd., of Soho Foundry, Birmingham, whose name is familiar wherever testing or weighing machines are used. The editor particularly wishes to express his thanks to Mr. S. Holroyd, who is in charge of the particular department dealing with the machines illustrated. Mr. Holroyd has made a special study of the requirements of the Aircraft Industry, and his notes on the various machines have been of great value in compiling this article.

So far as the shape of each illustration permits, the descriptive matter concerning each machine is placed in the immediate vicinity of the photograph.

the test the cube is sheared from the two blocks and the breaking load per superficial inch obtained.

Test pieces can be cut from a broken propeller and tested to destruction.

No. 599.—TESTING FOR TENSILE, COMPRESSION AND BENDING.—This is a handy machine for making tensile, compression and



No. 674. — GLUE TEST. — This machine gives a physical test upon glue, the stress being applied in shear.

The straining-screw and platen are raised sufficiently high to allow the specimen to be inserted, after which further strain is put upon the specimen by means of a tommy-bar inserted in the hand wheel, until fracture occurs.

Indications are read upon a gauge reading to 10,000 lbs., a maximum-pointer being provided to indicate the breaking load.

It is recommended that a double shear specimen be adopted, e.g., a 2-in. cube glued to two pieces, 4 in. by 2 in. by 2 in. During

bending tests. It has a capacity of 10,000 lbs., and requires no special foundation, though a level floor is, of course, essential.

All the latest refinements, such as semi-automatic grips for tensile tests, screw-propelled poise-weight, three speeds of straining screw, and a deflection and extension scale are provided.

Small wires, turnbuckles, and strips of steel can be tested in tension, bars of 36 in. centre and 4 in. by 2 in. section tested in bending, and rods up to $\frac{1}{2}$ in. diameter in shear. Specimens up to 10 in. by 3 in. can be tested in compression.

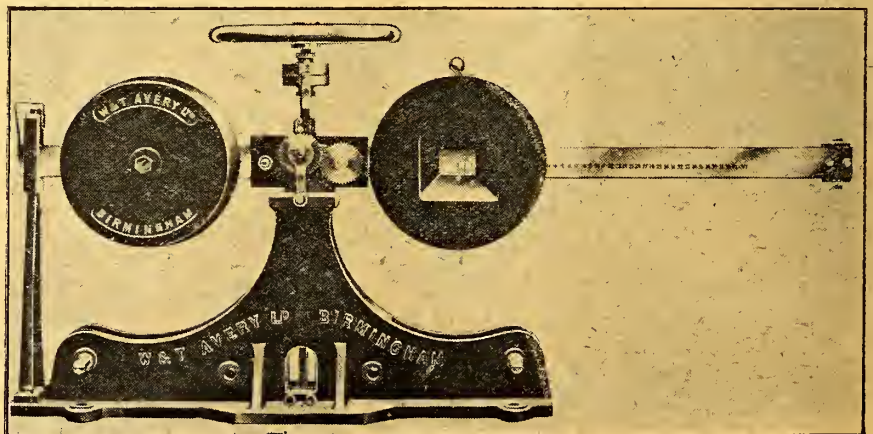
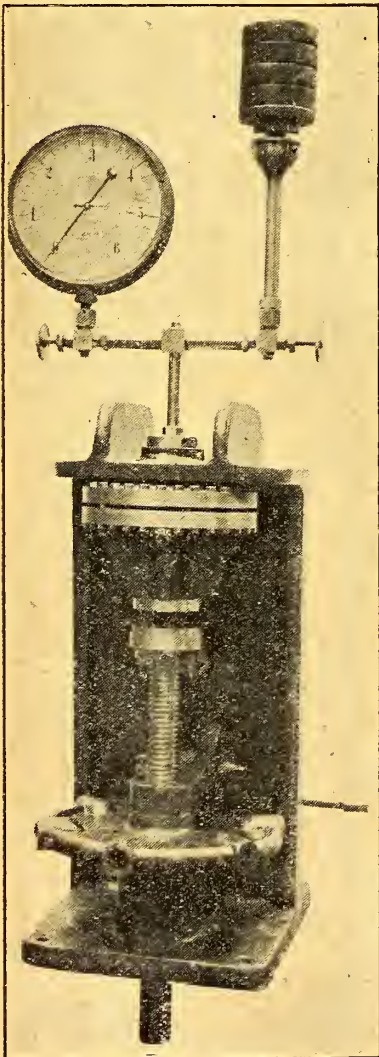
These figures can, of course, be modified to suit special requirements, and compression and bending tools omitted if required.

No. 627.—TRANSVERSE TESTER.—This machine has been designed for obtaining the modulus of elasticity and other figures necessary in calculating out strengths of timber for propellers, etc.

The test consists in bending a specimen bar of the material, which is placed in the frame of the machine under two pins. The straining wheel on the top of the machine operates a stirrup coming in contact with the underside of the bar, so effecting a bending stress.

As the strain is put upon the specimen by means of the hand wheel the "poise" is run out along the steelyard by means of a screw and gear-wheel attachment to keep it in equilibrium, and when the specimen fractures the load is read off.

Test pieces can have 12 in., 20 in., 30 in., or 36 in. centres,



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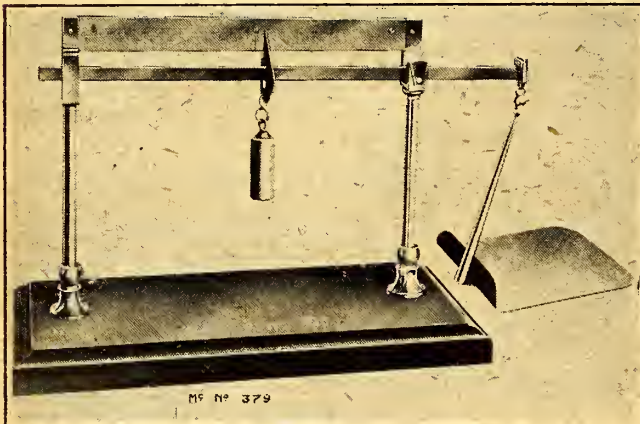
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with a section either 1 in. or 2 in. by 1 in. The capacity is 1,000 lbs., which is amply sufficient to break any kind of timber, and when fracture takes place a scale allows the deflection of the bar to be read off.

No. 379.—SPECIFIC GRAVITY COMPUTER.—In obtaining knowledge of material this machine is valuable in testing the specific gravity or finding the weight per cubic foot of the material used.



The unit adopted is equivalent to so many cubic inches, all specimens being cut to this size. They are placed upon the scale-pan, and equilibrium of the steelyard is obtained by means of a poise weight which then indicates the weight per cubic foot of the material, which, of course, gives the specific gravity at sight.

No. 270.—PLATFORM WEIGHER.—This is a platform weighing machine very suitable for weighing propellers, whether packed or otherwise, or any other bulky article. Those who have tried to weight propellers on ordinary spring balances or on swinging beam balances will at once appreciate the handiness of this method of weighing.

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terfered with or damaged by the article projecting over the edge of the platform.

The machine has a capacity of anything between 1 ton and 1 lb. The platform measures 36 in. by 36 in., and the whole machine is mounted on four wheels so that it can be moved from place to place conveniently.

No. 586.—FABRIC TESTER.—The firm of Avery has produced a machine for testing aviation fabrics such as are used in aeroplanes and airships, to conform with Naval and Military requirements.

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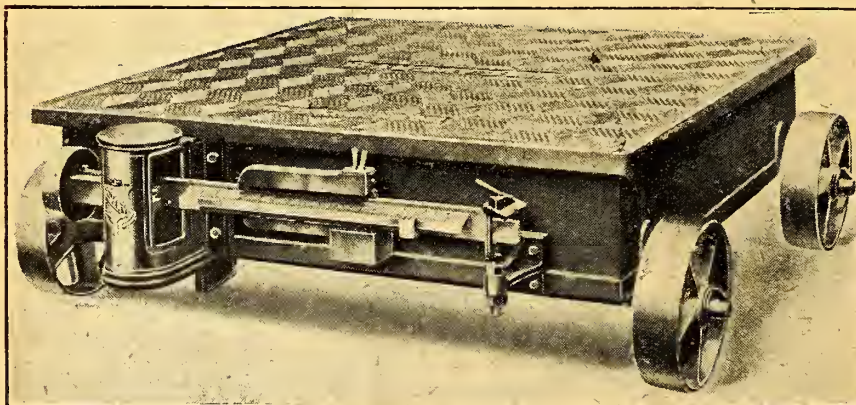
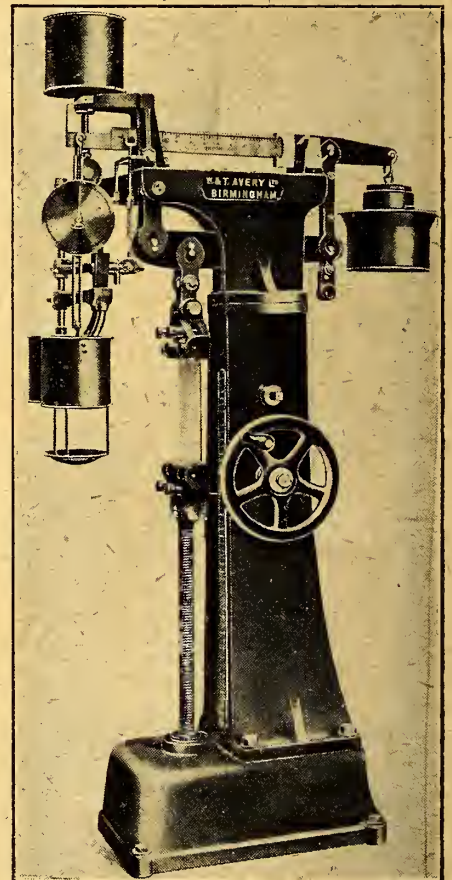
The shot are received by a can hanging from the nose end of the steelyard, the weight of the shot being transmitted through the leverage of the machine to the specimen.

In operation it is only necessary to put sufficient stress upon the specimen to lift the steelyard, after which the shot flow is turned on.

The indicator of the steelyard is then kept at the zero mark by the straining hand-wheel, which, in effect, only takes

up the stretch of the specimen, the loading, of course, being applied by the shot flow. Directly the fabric tears the flow of shot is stopped.

After the fabric has fractured the shot is weighed off. The test is practically automatic, so long as it is carried out according to instructions, and the figures are directly comparative to one another, as the conditions remain the same constantly.



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AERO ENGINES v. CYCLE ENGINES.

A rather unusual article appeared in the "Motor Cycle" some time ago signed by one "Argus," who claims to have served for 23 months in one of the Flying Services. This article purports to compare the merits of the aero engine and the motor-cycle engine, to the detriment of the former.

As a matter of fact it is utterly useless and misleading to compare utterly unlike objects, and, anyhow, the effort is quite valueless, especially as the criticism, if it may be so called, is based on entirely fallacious data.

The argument is based on the assumption that the top brake horse-power of an 80 Gnome is 65.5 h.p., and that a well-tuned 3½ h.p. cycle engine can be induced to give 10 h.p. The points made for the two engines are set forth as follows:—

80 h.p. Gnome.

1 h.p. equals, approximately, 182 c.c.
Minimum and maximum revolutions per minute, 800—1,200.
Hours running before cleaning is necessary, 20.
Life of engine before rebushing is necessary, 100-200 hours.
Petrol consumption, 6.5 gallons per hour.
Weight per h.p., 2.75 lbs.
Ratios in favour of Gnome:—
Weight, 2 to 1.

3½ h.p. Single.

1 h.p. equals 50 c.c.
Minimum and maximum revolutions per minute, 400—3,000.
Hours running before cleaning is necessary, 150.
Life of engine before rebushing is necessary, 1,000 hours.
Weight per h.p. 5.5 lbs.
Ratios in favour of 3½ h.p. single:—
Horse-power per c.c., 3 2/3 to 1.
Flexibility, 11 to 1.
Hours running before cleaning, 7.5 to 1.
Life of engine before rebushing, 7.5 to 1.
Petrol consumption, 4 to 1.

The conclusion "Argus" arrives at from these figures is that the cycle engine scores heavily over the aero engine on every count except weight per horse-power!

Where the fallacy of the whole argument comes in is an attempt to compare the life of the Gnome engine, which runs at practically full bore all the time, with the life of the 3½-10 h.p. single cylinder, which, under normal circumstances, would not be asked to develop more than 2½-3 h.p.

Does "Argus" seriously suggest that a 3½ h.p. cycle engine could be induced to give 10 brake horse-power for 150 hours before cleaning, and 1,000 hours running before rebushing? A Gnome engine has run for 16½ hours non-stop at full bore in the air, over three-quarters of its alleged normal life.

Unless "Argus" is prepared to assert that his 3½ h.p. engine could give 10 brake horse-power for a matter of 105 hours, non-stop, without the necessity for cleaning, his article is purposeless.

Incidentally, the 80 h.p. Gnome is admittedly an engine of low thermal efficiency, and scores absolutely on weight for h.p. Some of the new stationary aero engines ranging from 100-400 h.p. would, vulgarly speaking, knock spots off any motor cycle engine for ultra-efficiency.—W. L. W.

AERONAUTICAL ENGINES.

A long-felt want has been supplied by the publication of a work entitled "Aeronautical Engines," by Francis John Kean, B.Sc., now Sec. Lieut. A.S.C.

A number of writers have touched lightly on the aeromotor in books on internal combustion engines generally, and one or two elementary handbooks on the subject have also been turned out, and, of course, various writers have gone over the ground with more or less thoroughness in aeronautical and other engineering journals.

This book formed the subject-matter of a special course of ten lectures given by the author at the Regent Street Polytechnic, London, during the autumn of 1915, to men of the R.N.A.S., R.F.C., and other interested persons.

Of course, in these days it is impossible to include in any technical work a description of the very latest engineering practice, but Mr. Kean has selected for his criticism a number of pre-war motors of types which are still largely in use on active service.

Special attention is devoted to the balancing of inertia forces and a number of highly useful diagrams are included illustrating the various mechanical forces which are set up in an aeromotor.

The book is profusely illustrated with diagrams, drawings and photographs, and it should be of undoubted value both to learners and to engineers.

Among the engines described are the Beardmore, Salmson, Anzani, and Gnome (including the monosoupape).

The book is certainly the best thing of its kind that has ever been produced.

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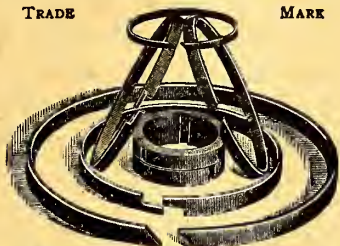
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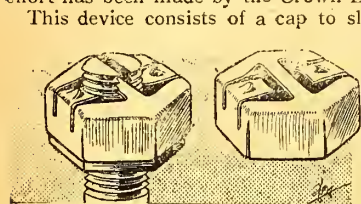
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If any person, having found any bomb or projectile or any fragment thereof, or any document, map, or other article whatsoever which he has reasonable grounds for believing or suspecting to have been discharged, dropped, or lost from, or to have been carried in or to have formed part of any aircraft or vessel of the enemy, or to have formed part of the equipment or personal effects of any member of the crew of such aircraft or vessel, without lawful authority, or excuse neglects forthwith after finding the same, or, in the case of any such article which was found before Oct. 3rd, 1916, as soon as may be after that date, to communicate the fact to a military post or to a police-constable in the neighbourhood, or, on being so required, neglects to send or deliver the same to the competent naval or military authority or some person authorised by him for the purpose, he shall be guilty of an offence against these regulations.

Where any such article is found at the place, where the aircraft in question or the wreck thereof descended no person shall, without lawful excuse, displace, remove, or otherwise interfere with such article, and, if any person does so, he shall be guilty of an offence against these regulations.



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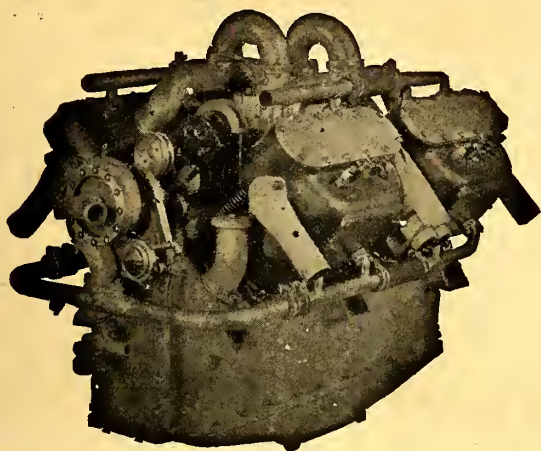
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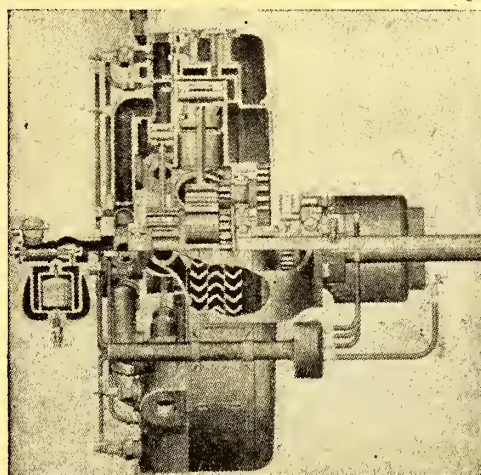


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ON THE PESSIMIST AND THE IDEALIST.

Some people are mighty hard to please, and some people are a great deal too easy to please. Some people are both at the same time. That is to say, when the person who is too easily pleased finds something to please him, it is very hard to please him with criticism of the thing which pleases him: which sounds a trifle complicated till one works it out.

In other words, some optimists are so unthinkingly and blindly optimistic that anyone who dares to criticise things as they are and to suggest improvements is promptly branded by them as a pessimist. What these optimists cannot understand is that a pessimist merely grumbles and prophesies disaster, whereas the person who grumbles and yet keeps on hammering away with plans and suggestions for improvements is the very reverse of a pessimist. He is, in fact, an idealist, which is several steps ahead of any optimist.

If you want to see the optimist at his worst, contemplate a fat ox standing placidly chewing the cud in the pen of a slaughter-house. Everything is well with him: he is full of good food: the sun is shining: his imagination does not extend to the other side of the slaughter-house door: he is blind optimism materialised. The peculiarly ox-like qualities of the average man, his strength, his willingness to go where led or driven, his stolid stubbornness under some circumstances and his silly panic under others, and his thick hide—morally and mentally—make the likeness very complete. Left to himself, the Englishman never has done and never will do anything; but, properly led and governed, he can do anything. But he always hates the people who goad him into mental activity. Which is one reason why idealists are by him called pessimists.

As an instance of the typical English outlook, the following extract from a letter which reached a good friend of mine from the front the other day is worth quoting. Discoursing of the Zeppelins brought down, the writer says:—"I must say that C. G. G. hardly ever seems satisfied with the results achieved, and must criticise harshly. Perhaps he belongs to the pessimist class. If so, he should come out amongst the lads, and they will take care of him and turn him into an optimist within a week." To which my friend adds:—"You see, you are even criticised from the depths of the trenches; so cheer up, and give our lads something to smile at occasionally!"

I only wish I were able to be "out amongst the lads," as this sportsman puts it, if thereby I could be of any more use than I am at home; but I have my doubts about the optimist part of the programme, so long as the ideal of aerial and other equipment remained unfulfilled.

WHAT MIGHT HAVE BEEN.

Consider what would have happened in the past if such a happy state of optimism as this writer indicates had been allowed to continue unchecked throughout the war.

At the very beginning our optimistic English Press

regaled us with tales of starving Uhlans and footsore, weary infantry patrols in Belgium which surrendered to solitary Belgian sergeants who went out and enticed them in with slices of bread and butter. And, as a result, everyone in this country, except the pessimist-idealists, despised the Germans and said that the French Army, plus our Expeditionary Force, would have them whacked in a few weeks.

We were filled up with stories of the prolonged defence of Liège, whereas, in fact, the forts surrendered or were blown to bits in about three days after the Germans got their heavy guns onto them.

Our optimistic Government prevented us from hearing any news of our Expeditionary Force, doubtless believing in their ignorant optimism that the said B.E.F. would roll the Germans back with one hand. All the while Sir Horace Smith-Dorrien, an idealist if ever one existed, was fighting the greatest and most momentous rearguard battle of all history. Yet there are those who will tell you that Sir Horace was a pessimist—especially concerning a certain salient, about which he was afterwards proved to be perfectly right.

Presently a wicked pessimist, named, I believe, Hamilton Fyfe, wrote a pessimistic dispatch, which was published by another pessimist named Northcliffe, which told us that the British Expeditionary Force was a beaten army, but not a broken army. And that was the first intimation that the optimistic English ox had that all was not just as it should be at the Front.

After that, this same pessimist, Lord Northcliffe, disturbed the digestion of the English ox with gloomy tales about lack of men, and lack of machine-guns, and lack of high explosives. And in due course came Conscription, and the Ministry of Munitions, and German Army reports complaining of the overwhelming British artillery.

Now, who produced the things which produced those German reports? Was it the pessimists who cried aloud for greater effectiveness, or was it the optimist who was content to believe that, because the British soldier was, and is, man for man, better than the German, therefore the British soldier was superior to German science and machinery.

DIFFERENCES.

Similarly, certain pessimists raised a cry for younger generals, and what was the result? In the earlier days we had Neuve Chapelle and Loos and Hulluch to regret, and the Staff was a scoffing and a by-word to the young and intelligent officer of the Line.

The other day, two young friends of mine, just back from the Somme, were talking about the Big Push. Said the Infantryman: "Things are a bit different now from what they were when I first went out. The Staff work is topping, and one of the most astonishing things is the young generals one sees about. One hardly ever sees a Brigadier who looks more than thirty-five, and lots of 'em seem less. And they're full of go, all of 'em." "Yes," chimed in the Motor Transport officer,

"it's an improvement on the time when every General Officer started the day's work with six Bishop's Varillettes and a dose of Eno's Fruit Salt."

Which brief word-picture sums up the situation about as well as it could be put.

And then there is the matter of the "Tanks." Rabid idealists have been prophesying ever since the autumn of 1914 all kinds of death and damnation if these moving forts were not put into use. Cheery optimists prevented them from being built in time for Neuve Chapelle and the rest—as they could have been easily. Military idealists, who knew what we were up against, because they had been there, approved the idea highly, but they were not big enough men to get things done. Now that we have got a few, just a fraction of what we might have had by this time, everybody has gone crazy with enthusiasm over a weapon of a type which ought to be out of date. And yet people call the original apostles of the Tank idea pessimists, because the death and damnation which they prophesied did not arrive, thanks to the tenacity, bravery, and devotion of Mr. Thomas Atkins. Yet Mr. Atkins suffered because the optimists depended on him instead of on the engineering skill of the idealists.

MISREPRESENTATION.

The trouble of all idealists is that they interfere with vested interests. Which means that they inevitably have a "bad press." Any reform must upset somebody in some high position, and anybody in any high position always has newspaper influence behind him—otherwise he would not have got there.

Fleet Street is full of idealists whose idealism has been squeezed flat by the need for bread and butter. Which is one reason why one hardly ever reads anything in a daily paper which rings true, for nearly every newspaper man writes to order, and not because he believes what he is writing. When one sees a rigid teetotaler writing rabid articles against the restraint of drinking, and a drink-sodden hack pouring forth columns in favour of closing all public-houses, and when one sees a philosophic anarchist denouncing interference with landed property, and an owner of a little bit of house property advocating State ownership of everything, one begins to understand why the daily Press is so utterly unconvincing to anyone with intelligence. Yet the average man is not sufficiently intelligent to see when an article is sincere and when it is not.

That is why the majority of people believed that the agitation of the first three months of this year in favour of adequate aerial defence was worked up by pessimists—or by self-advertising humbugs—instead of believing that the agitators were working towards a higher ideal. The majority of people never had a chance of learning that the whole force of the Coalition Press was turned on to boom the self-advertising humbugs who were responsible for the inefficient aeroplanes and engines which have cost the Royal Flying Corps so dearly, and to discredit those whose sole object was to secure better organisation and equipment.

The Press reports of the evidence before the R.F.C. Inquiry Committee illustrate this excellently. First of all, everything of possible military value to the enemy was very rightly cut out by the Censor—and that meant pretty well everything adverse to the administration of the R.F.C. Then everything obnoxious to the political people and their official friends was cut out by the various party editors, and what was left was, obviously, only what was calculated to make the critics look foolish in the eyes of newspaper readers.

Curiously enough, much of the same thing is being repeated to-day in the matter of music-hall and theatrical morals. General Smith-Dorrien, whose kindly yet firm rule at Aldershot produced the cleanest, most self-respecting, and most efficient Army the world has seen,

is agitating for a higher tone in the entertainment offered to our troops on leave. But the theatres and music-halls are good advertisers in the daily papers, and distribute free seats, free drinks, and free cigars lavishly to hack journalists who pose as art critics in these days. The success of General Smith-Dorrien's campaign would lessen the receipts of certain pornographic entertainments and entertainers, so his high ideals meet with a bad press. The papers put forward the old idiotic argument that to the pure all is pure, or that our soldiers from the provinces and Colonies are grown men, with full-grown vices of their own, and are not likely to be any worse corrupted than they are at present.

A FLAW IN THE LOGIC.

Which arguments remind me of one of the pioneers of aviation who possessed a reservoir of utterly unpublishable language, which flooded his shed, engulfed workmen and material alike whenever anything went wrong, and poured forth among the spectators of both sexes who in those early days hung round inquisitively watching his experiments. A mild remonstrance to the effect that his oaths and curses were likely to offend feminine auditors produced the reply that, if a woman was as virtuous as she ought to be she would not understand what he said, and that if she did understand she could not be made any worse than she was already.

There is a flaw in the logic somewhere, and there is a similar flaw in the newspaper defence of lewdness on the stage. The result, anyhow, is that General Smith-Dorrien, one of the finest soldiers this country has ever produced, is branded as a pessimist, and is held up as a kind of combination of Chant, Charrington, and Chadband.

When I was let loose in London somewhere about twenty-five years ago, I do not suppose my morals were any better or much worse than those of the average public-school boy of that period, or of to-day, but I distinctly remember that the low tone of the music-hall of the period was a great surprise to me. Doubtless the tone has been raised since then, but the obvious vulgarity of the very low comedian of that day has merely given place to the cleverness of the more or less easily understood *double entendre* of the modern stage. The higher education of to-day helps to the understanding of the subtle indecency, and so the net result is much the same. The ancient joke about the lodger has been replaced by the intrigue of the eternal triangle, that is all. One hopes that the misrepresentation of the gallant General in the Press may help him to understand the position of other idealists on whose statements he has sat, and is still sitting at intervals, in judgment, for his position at present and theirs some six months ago are not dissimilar. He hopes for a higher plane in entertainment at home. We hoped then for higher 'planes at home and abroad.

Seemingly we have acquired them, seeing that when we began agitating our aeroplanes had to stagger off across the lines at 7,000 or 8,000 feet, and took half an hour or more to get there, whereas now they fight their battles at 12,000 to 15,000 feet, and grumble at a machine that climbs less than 1,000 feet a minute.

But the fact that our ideals of mid-1915 have been attained towards the end of 1916 is no reason for self-complacent optimism. Every credit is due to those officers who have done so much, despite so many difficulties, but there are still things that might be better. Which is why a touch of pessimism is a necessary part of the idealist's outfit.

THE SPREAD-A-GLOOM CLUB.

I have lately been reading a priceless production called the "Maidstone Magazine," which is the organ (or rather the restaurant orchestra) of a certain Submarine Flotilla. Apparently one of the most valuable assets of the said flotilla at the outbreak of war was an insti-

tution known as the Spread-a-Gloom Club, composed, so far as I can gather, of one officer and his dog. Probably the Submarine Service was then, as it is now, the most efficient of the King's Armed Forces, consisting, as it did, of unregenerate pirates who proceeded as requisite, more or less at their own sweet will when once out of port; but one can picture to oneself the salutary effect on younger and more optimistic officers of that gloomy idealist who craved for yet greater efficiency and for yet greater effectiveness. The growth of the "Trade" and its equipment since then has doubtless justified all his prophecies and warnings.

If only the whole British Empire had had a Society for the Propagation of Gloom at the very beginning of the war, we might have been in Germany by now, especially if at the same time a Co-operative Looting Society had been formed, with official sanction, to start operations as soon as the Army reached German territory. A proper sense of the seriousness of the situation at the start would have helped immensely in energising the production of fighting men and munitions, and the prospects of material reward when enemy territory was reached would have acted as a further spur to activity. If the Fleet is entitled to prize-money as reward—albeit inadequate—for capturing enemy ships, why should not the Army be rewarded in kind for capturing an enemy town?

The munition worker, who in multitudinous cases ought to be in the Army, is, as a rule, over well paid for providing the means with which to defeat the enemy, so why should Mr. Thomas Atkins and his officers alone be without prospect of material profit at the enemy's expense? The unreasoning optimists who misgovern this country are rather apt to take advantage of Mr. Atkins' good nature. A little more pessimism might do a world of good in aiming at higher ideals.

ON FLYING SERVICE IDEALS.

In just the same way the Flying Services have suffered because of unthinking optimists, and have profited by pessimistic idealists or idealistic pessimists—whichever way you like to put it.

At the very beginning of the war the R.F.C. saved the British Expeditionary Force, although it is doubtful whether out of its five nominal squadrons it was ever able to send a dozen aeroplanes over the enemy's lines at one time. The R.N.A.S., also, in various ways helped to assure the transport of the B.E.F. across the Channel, and a tiny detachment did gallant work in Belgium, before and after the fall of Antwerp. Consequently, all the optimists announced that we had the finest flying services in the world, that we had the best pilots—which was true—and the finest aeroplanes—which was only true of about 5 per cent. of them. And even General French

talked gaily in his official dispatches of our marked dominance in the air.

If you will refer to "the easy, 'Oh, King, live for ever!' files"—as Mr. Kipling calls them—of contemporary papers, you will find how they then impressed on the populace that all was well. Yet certain of us held, even before the war, that it was not unreasonable to think of aeroplanes in thousands—and we were called fools for our pains. Nevertheless to-day we have more aeroplanes than were ever dreamed of by the most enthusiastic of us.

Before the war we clamoured for encouragement for British designers of engines and aeroplanes, and claimed that they could beat the world. We were told by Colonel Seely that we could let other countries do the experimenting. And when war broke out, as prophesied, we had to buy all our engines and most of our aeroplanes from France.

Then at the beginning of the war we had the temerity to disbelieve our official optimists, and to demand more and better aeroplanes and engines, and to demand a free hand for British designers and constructors, without interference by Government "experts."

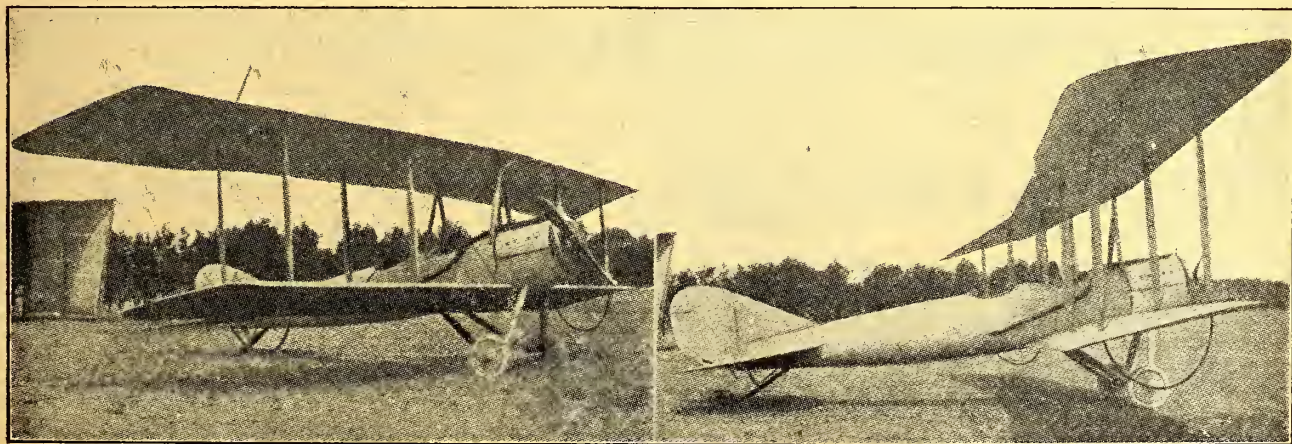
Again we were called pessimists, and were assured that the Royal Aircraft Factory and the precious Government Advisory Committee knew far more about the design of aeroplanes and their construction than any mere commercial manufacturer.

And then came the Fokker scourge, and the astounding development of the German anti-aircraft guns, and raid after raid by German airships which patrolled this country unhindered. That is what your stipendiary optimists in official positions did for you at a time when our ideals were to produce the biggest fleet of the finest aircraft in the world. To quote again the "Maidstone Magazine," it was enough to make one "cast the vome."

AGITATORY PESSIMISTS.

After which, pessimists like Lord Montagu, and Mr. Joynson-Hicks, and Captain Bennet-Goldney, and Mr. Pemberton-Billing, not to mention Dr. Lynch and Sir Alfred Mond, got up in Parliament and told the Authorities exactly what they thought of them.

Wherefore there ensued certain Committees and Boards and things, which denied that things were as we said, and took much pains to prove out of the mouths of those responsible for what was wrong that everything they had done was right, and that all of us idealists were merely lying pessimists. And, having done so to their own satisfaction, the aforesaid Committees and Boards proceeded to do just the very things we had all advised months and months before, and what they did not do themselves the Naval and Military Authorities did for them.



The L. F. W. Biplane, an American biplane of Hunnish appearance, built by the Heinrich Aeroplane Co.

First-class officers were put into positions where their ability had reasonable scope. A real man, who was a real engineer, with real experience of production and construction, was set to work to reorganise the Royal Aircraft Factory. And it even came about that the best aeroplanes designed by mere trade firms were contracted out to other firms, and that British motor firms were encouraged to produce bigger and better engines of their own. With the result that to-day we have undoubtedly the biggest and the smallest and the fastest and the quickest-climbing and the easiest-handled and the most stable and the best all-round aeroplanes in the world.

And this absolutely and directly in spite of the most strenuous efforts of the Government's optimists.

For which one cannot help claiming that, but for the consistent pessimism which refused to admit that all was for the best in this best of all possible worlds, things would have drifted on in the usual officially optimistic way, and so we should never have reached the state of effectiveness which we have reached to-day, a point which about coincides with the ideals which some of us, including the undersigned, had set up as attainable about the end of 1914 if there had been no war.

C. G. G.

AN ACCOUNT OF GOOD WORK.

So many readers of THE AEROPLANE have contributed to the R.N.A.S. Comforts Fund in cash or kind that it seems well to give as full an account as possible of the Fund's work during the past year. It is impossible to go into detail as to where the comforts have been sent, for doing so would mean disclosing to the enemy the precise whereabouts and numbers of the R.N.A.S. squadrons, but one may mention that consignments have been sent to detachments as far apart as Central Africa, Mesopotamia, Dunkerque, and Salonika, not to mention seaplane carriers in the North Sea, the Eastern Mediterranean, and the Indian Ocean.

The whole of the work has been done by Mrs. Sueter, the wife of Commodore Murray F. Sueter, C.B., R.N., Superintendent of Aircraft Construction. Mrs. Sueter has worked indefatigably for the past two years and more to show the men of the R.N.A.S. that they are not forgotten by those at home.

In the early part of the war men were sent off in a hurry to distant parts of the world, not all of them were able to draw full winter kit before they left, and many had neither the time nor money to buy extra warm garments. Even the full Admiralty allowance was not always sufficient for men whose work necessitated their wading about in icy water retrieving seaplanes, and handling machines on the decks of seaplane carriers with spray washing over them, so despite the good pay of the R.N.A.S. the garments were highly appreciated. Also, the rough work of handling aircraft destroys clothing rapidly, and the garments sent by the Fund were always useful to replace damaged gear which the men at outlying stations could not buy.

Later on, as the men's equipment became more com-

plete, clothes were less needed, but other forms of comforts were wanted. Games, both indoor and outdoor, were sent to help in keeping the men happy and contented when off duty in places where there are no towns to provide entertainment. Cigarettes, tobacco, pipes, writing paper, pens and ink, and even sweets, were sent. Gramophones and records were bought, or were presented to the Fund, and were highly appreciated by the men.

It is worth noting that the things sent were the things which the men wanted, for before sending consignments to the various detachments Mrs. Sueter has asked the Commanding Officers what their men particularly needed.

Mrs. Sueter has acted as Secretary, President, Committee, Buyer, Chief Packer, and Dispatch-Clerk to the Fund, and the list given below indicates the astonishing amount of work this energetic lady has done. The only assistance she has had has been given by one or two friends occasionally, by her two small daughters, and by her own domestic staff. The success of the Fund proves the old saying, "If you want a thing well done, do it yourself."

Now, however, the R.N.A.S. has grown to such a size that to do it anything like justice the Fund must work on a scale far too great for any one man or woman to do it justice. Moreover, under the new regulations, introduced owing to the number of fraudulent charities which have been discovered, all funds appealing for public subscriptions must have a committee and must be registered. Therefore Mrs. Sueter has now formed a Committee for the R.N.A.S. Fund, and the Fund is now in process of being registered, an operation which like every other official takes an unnecessarily long time to get

THE R.N.A.S. COMFORTS FUND'S ACCOUNTS FOR 1915-16.

INCOME AND EXPENDITURE ACCOUNT, SEPTEMBER 30TH, 1916.

Income.			Expenditure.		
	£	s. d.		£	s. d.
To Balance as at 31st October, 1915	173	18 6	By Jerseys and Sweaters	177	11 0
Donations, Contributions and Collections received			Gloves and Mittens	10	15 0
from Well Wishers of the Royal Naval Air			Shirts	108	1 8
Service	683	5 8	Cardigans and Helmets	7	9 6
			Handkerchiefs	1	10 0
			Pants	33	15 11
			Vests	114	7 2
			Buttons, Tapes, etc., Towels, Meat Lozenges,		
			Soap, Sweets, Stationery	49	11 8
			Socks	28	15 0
			Scarves, Wraps, etc.	18	0 0
			Gramophones and Records	147	2 2
			Sundries	9	19 1
			Cigarettes, etc.	49	13 6
			Books, Games, etc.	33	17 8
			Stamps and Postages	4	11 0
			Packing, Rail Expenses, etc.	13	2 9
			Bank Charges	0	3 10
			Balance in hand, September 30th, 1916	48	17 3
	£857	4 2		£857	4 2

We certify we have checked the account with the books and in our opinion the account is properly drawn up so as to correctly period from October 31st, 1915, to September 30th, 1916.

September 27th, 1916.

vouchers of the Fund and find same to be in accordance therewith. show the receipts and payments on account of the Fund for the (Signed) THORNTON, MURRAY & THORNTON.

Chartered Accountants.

. The .

Sopwith Aviation Co.

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through. Meantime it is, apparently, illegal to appeal for public subscriptions, but if any friends of Mrs. Sueter or of anyone concerned in any way with the R.N.A.S. care to send along subscriptions in a purely private capacity, just to keep the Fund going till officialdom feels inclined to do five minutes' work in sanctioning the registration of the Fund, there seems to be nothing to stop them. Mrs. Sueter's address is still, as heretofore, "The Howe, Watlington, Oxon."

The accounts of the Fund have been duly audited, in accordance with the new regulations, and disclose the state of affairs shown hereunder, as at September 30th. It is obvious that the £48 odd balance in hand at that date will not go very far to provide winter comforts and Christmas presents for the men.

As giving some idea of the work of the Fund, it is worth while to note the number of separate articles which have passed through Mrs. Sueter's hands. They are as follows:—

R.N.A.S. COMFORTS FUND. LIST OF COMFORTS SENT.

	No. Sent.
Flannel Shirts	1,918
Cardigan Waistcoats	1,048
Belts	717
Mufflers	4,258
Mittens or Cuffs (pairs)	3,305
Pants (pairs)	2,255
Jerseys	2,336
Socks (pairs)	3,897
Wool Vests	1,912
Helmets	1,161
Gloves (pairs)	820
Cotton Vests	180
Spencers and Waistcoats	37
Caps	73

Long Stockings (pairs)	163
White Shirts	50
Handkerchiefs	605
Sundries, such as Slippers, Tinder Lighters, Towels, Bandages, Rugs, Pyjamas, Collar Studs, Chest Servers, etc.	266
Novels and Magazines	581
Stationery, Blotting Pads, Ink Pots, Writing Blocks, etc.	323
Pencils	846
Envelopes	5,825
Tins of Sweets and packets of Chocolate	273
Cocoa and Milk (in tins)	25
Soup Squares, Lozenges and tins of Soup	90
Shaving Necessaries (soap, brushes, paper, etc.)	258
Toothbrushes	144
Soap Tablets	636
Games, Draughts, Dominoes, Cards, Chess, etc.	119
Footballs	8
Cricket: 4 balls, 3 pair pads, 1 pair gloves, 3 sets stumps, 3 bats, 1 net	15
Boxing Gloves (2 sets)	8
Bags containing assorted comforts	75
Provisions: Tinned Fruit, Meat, Salmon, etc.	97
Cigarettes (also large quantity of Tobacco)	58,680
Gramophones	52
Records	346

93,402

The astounding variety and quantity of the articles in the list show how hard the energetic lady who has hitherto done all the work of the Fund must have laboured for the good of the men of the R.N.A.S., and one hopes they are duly grateful. One also hopes that the readers of this paper may support the Fund in the future very much better than they have done in the past.—C. G. G.

HELP ROUMANIA!

Judging by the newspaper reports, Bukarest and other Roumanian towns are being bombed by German aeroplanes, and even by Zeppelins almost every day, and apparently in broad daylight. The Germans, of course, know how much resistance they meet, but one may draw the obvious conclusion that either the Roumanian aviators are very busy with their armies and have no time to attend to these matters, or else that they are inadequately equipped. Roumania is not a manufacturing country, so in any case it is hardly likely that she can maintain or increase her supply of aeroplanes. It seems, therefore, that it is the bare duty of this country to help her out in her time of trouble, considering that she came into the war for our good.

Great Britain has nothing to be proud about concerning the way she has backed up her small Allies—look at Belgium and Serbia as examples. Doubtless her intentions were good, but the energetic and efficient Hun does not wait for his enemy's good intentions to be fulfilled. He merely acts. He is no believer in the "*Tirez, Messieurs les Anglais*," style of warfare.

We cannot send troops to Roumania, but we can send aeroplanes and pilots, and, if we are to do anything of the sort, we must act at once. There are dozens of able-bodied R.N.A.S. pilots, ready equipped with the most modern aeroplanes, who could reach Roumania in a couple of weeks from now, if prompt action were taken. French pilots, led by our old friend Sous-Lieutenant Louis Noël, have shown how easy it is to get to Bukarest by air. It is only a matter of 240 miles across Bulgaria from Greek territory held by the Allies to Roumanian territory.

At worst, that is only three hours' journey, and with a favouring wind it can be done in less than two hours. A modern British aeroplane with three hours' fuel could do the journey carrying a mechanic as well as the pilot, and enough spare metal parts to keep itself going when it

got there. Spare wooden parts—wings, under-carriages, and so forth—could be made in Roumania. There are unlimited supplies of fuel and oil in the country. Therefore there need be no delay about getting together stocks of spares before starting.

Hundreds of R.N.A.S. mechanics would volunteer eagerly to go as passengers on the trip across Bulgaria if they had the chance, and a couple of dozen of them, if picked for their workshop ability, would soon train Roumanian mechanics to do all the minor jobs of keeping the machines in running order.

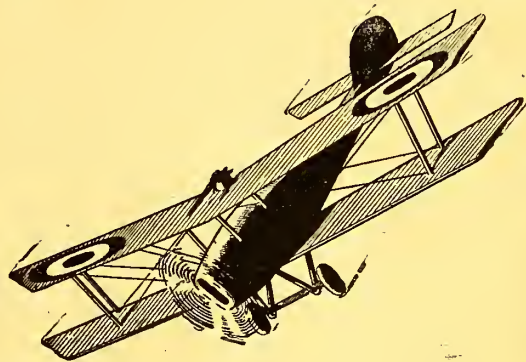
In this simple way Roumania could be entirely freed from German aircraft in a month, if the matter were taken in hand at once and pushed forward energetically.

Fifty machines, with pilots and mechanics, could leave England in a week. A week or ten days later they would be in Salonika, and three days later at most they would be in Bukarest. If a hundred machines were sent, and only seventy-five got there, the thing would be worth doing, and there is no reason why, with modern engines, they should not all reach their destination. Only, of course, the scheme could not succeed unless the arrangements were left entirely to one man, who would have to be given an absolutely free hand, without hindrance from people with their own little departmental axes to grind.

If such a scheme were carried out successfully, it would be an immense feather in the cap of the R.N.A.S., and it would provide really useful employment for a number of able-bodied young men who at present are doing little or nothing to justify their existence. Only it will have to be done within the next fortnight or so if it is to be done at all.

The R.N.A.S. has here a real chance of proving its usefulness, and those at the head of the Service have an opportunity of showing whether they are able and energetic organisers: C. G. G.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

The Curious Activities of the Aeronautical Institute.

With further reference to the list of names which is being used as a bait by the so-called "Aeronautical Institute of Great Britain," THE AEROPLANE is authorised to state that Lord Montagu of Beaulieu has entirely severed his connection with the concern, and has given instructions that his name is not to be used by the "Institute" for any purpose whatever.

The Secretary of the Navy League writes to state that the name of Mr. Robert Yerburgh, President of the Navy League, has also been withdrawn from all connection with the "Aeronautical Institute."

Nevertheless, the self-propagation campaign of the "Institute" seems to be continuing with unabated activity, and it would be interesting to know how much of the donations handed over by unwary but patriotic persons to the "Director" of the affair for the furthering of aeronautical research and so forth is being expended on circulars and stamps to catch further donations.

An example of the "Institute's" methods is disclosed in a letter from a Lieut.-Commander R.N., who writes: "I was dining with Commander — last night, and he handed me the enclosed and asked me about it." The enclosure consisted of the "Institute's" usual grandiloquent circular letter and the pretentious list of "supporters of the Institute," to which reference was made recently in this paper. The said list still continues to

make unauthorised use of the names of noblemen, officers, and gentlemen who have withdrawn any support they may have been inveigled into giving the concern.

The officer quoted continues: "I told him all about it. But the point is that Commander — has a fine place in — shire, and is, I suppose, what one might term one of the 'county knuts,' and would be just the sort of man to give his £1 rs. merely from public spirit to help a concern that sounds fairly worthy. The circular was addressed to his country residence."

From this one judges that the "Institute" is touting for subscriptions and donations on a thoroughly scientific method, and is working its way steadily through Burke, Debrett, "The Landed Gentry," "Who's Who," and such works of reference, doubtless with excellent results to its own finances, if without any observable benefit to the progress of the science or practice of aeronautics.

The Editor of "Truth" writes that his attention has already been drawn to this "Institute," but apparently the matter is not considered to be of sufficient general interest to be handled in that excellent and influential paper. One hopes, therefore, that the proposed announcement to the Press from the Royal Aero Club, the Aeronautical Society, and the Society of British Aircraft Constructors in combination may be issued without unnecessary delay.

C. G. G.

AIRCRAFT IN THE HOUSE.

Parliament has now met again, and it is again necessary to devote space to the doings of that assembly. There is, however, some satisfaction in noting that the first speeches of this session on the subject of aircraft have been of unusual merit. Dr. Arthur Lynch told the Government some simple home-truths, and Mr. Pemberton-Billing's outspoken speech must have gone far to prove to the House that his outlook on the Nation's affairs is reasonable, and that his knowledge is worthy of respect.

On man-power, on graft, and on aircraft Mr. Billing spoke plain facts and made convincing deductions from them. It is much to be regretted that the subservient Party Press has so scrupulously obeyed its masters' injunctions that Mr. Billing is not to be reported, except where his utterances afford an opening for adverse or sneering criticism.

Owing to the lamentable coalition of Parties no opposition can obtain a hearing, so it is to be hoped that Mr. Billing will report his own speeches in full in his new paper, "The Imperialist," which can, if it be properly run, be made into one of the greatest anti-party political organs of the age, if not of all history.

THE AEROPLANE cannot afford the space to report these speeches fully, but the leading points and phrases are given verbatim, and sufficient may be seen to show that Mr. Billing has hit on subjects which all of us know to be crying scandals, not only in the Aircraft Industry but in many, probably in all, trades.

Speaking on October 12th on the Vote of Credit, Mr. Arthur Lynch said:—Some of us in this House from the very beginning of the war began to agitate for a great aeroplane fleet. Members of the Government, in their usual style of superior knowledge, pooh-poohed that idea as something impossible, and then, after a very long period, they adopted the expedient of forming a Board. We want an aeroplane fleet which will give us a mastery of the air, which will be the cavalry of the air, which will be one of the decisive factors in winning this war; the Government has given us a Board—a Board devised after a style more or less familiar of doubtful joint stock companies in the City which begin by giving a front-window dressing of well-known names.

The representative of that Board in the Commons is, I believe, a man of good intentions. He has done that extraordinary thing for a member of the Government, he has actively looked into the matter himself, and has endeavoured at some personal fatigue and peril to himself to be as efficient as possible. All that is to his credit; but, after all, he is not the director of the work of this Board; and, judging entirely by results, I would say that that Board has been a lamentable failure. The Board has not given us what we have a right to demand, that aeroplane fleet which once for all will show a superiority over the Germans, so that no German aeroplane can ever dare to show itself above the horizon. What I say is a possibility. Had the matter been accepted from the very beginning in the spirit in which some of us brought it forward, had true energy been put into the work, had we less of the Gambetta spirit and more of the spirit of Lazare Carnot, the organiser of victory, we should have had to-day, not a Board of high-sounding names and practical incompetence, but an aero-

plane fleet. What was the dream of some of us could now be the reality of all. . . .

I would say that it would have been possible, had this matter been tackled in a right spirit, with adequate intelligence and energy, to have at the present time a fleet of 30,000 aeroplanes. It would not have been used for these sporadic raids, which looked well in the "Daily Mail" and the "Daily Chronicle," and so on, and which come in so very à propos when it is necessary for Ministers to come to this House to ask for £300,000,000; but for raids which would accomplish something definite and decisive towards the rapid winning of the war. With a fleet of that kind it would be possible to have not a mere raid on Combes or Strasbourg or what not, but a continuous raid on points properly selected as part of a great plan which would, one by one, reduce these strong places to impotence so that the plan could be carried out methodically on to the next point. . . .

There is a possibility that the war may still last three or four years, and even now that possibility should be faced and this fleet be made a reality. . . . At the beginning of the war I was very diffident in offering my judgment at all. I had a great respect for the authorities on the Front Bench, a respect which I now see to have been entirely misplaced.

[One wishes that some of the mere party members dared to speak their minds. They would say much the same thing.]

Mr. Billing said: I should like to refer briefly to some of the remarks which have been made here this afternoon on the question of man-power. The attitude of this House towards Conscription seems rather strange. When this House put the weapon of Conscription into the hands of a weak and vacillating man I really do not know how they could possibly conceive that any useful purpose would immediately come out of it. . . . It would have been very useless to expect all things of one type of gun, and it is very useless to expect one thing from all types of men. We see some of the best brains being hopelessly misused. I would suggest to the Minister for War that brains as well as bravery play, and will play, a dominant part. I know a case myself of a professional man in the City, a man of exceptional ability, who was called up under the Conscription Act. I do not think he was asked what his qualifications were. He was a successful professional man at nine o'clock one morning, and he was a number at five minutes past nine. Within a couple of months, and at the present minute, he is helping to make a road somewhere in the country with pick and shovel, having been lent to a contractor who presumably makes the road at a profit. If we are going to turn the brains of our country about like that, it would seem as if we were running for a fall. . . .

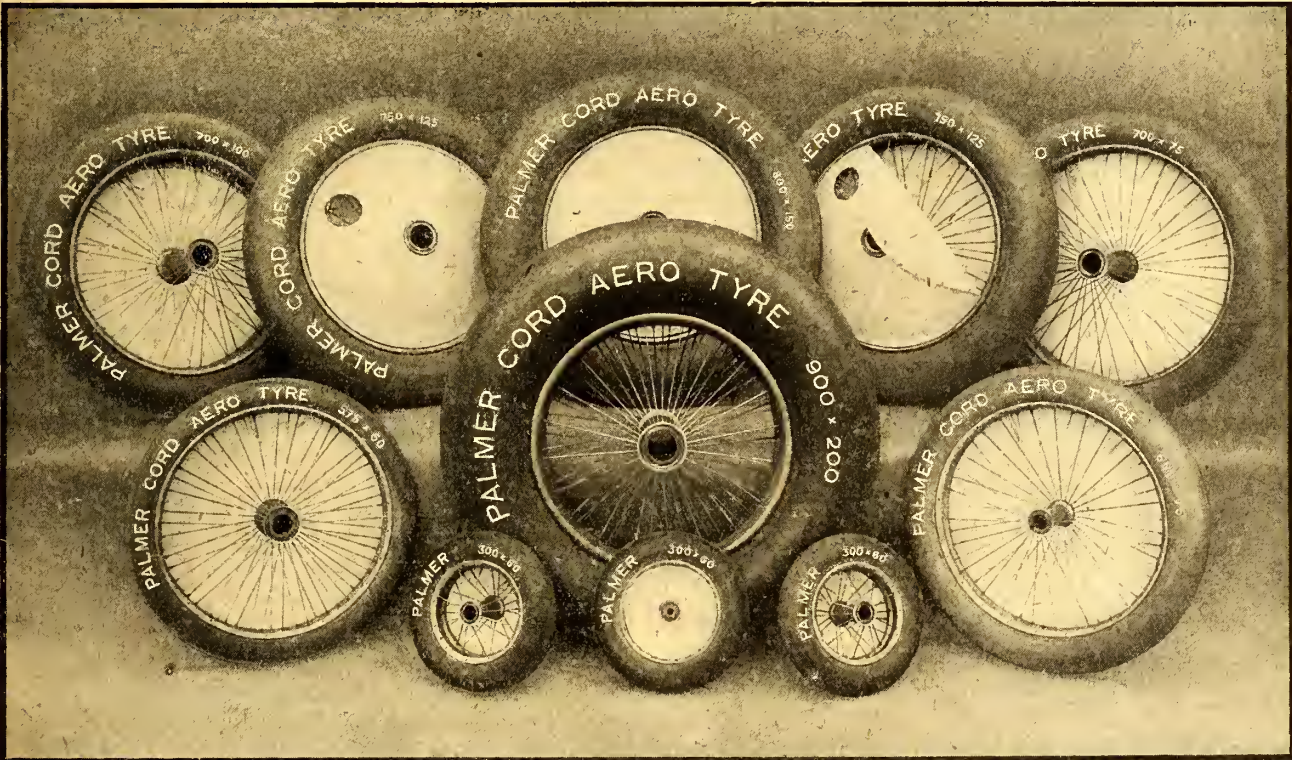
[One agrees, subject to one doubt. Mr. Billing does not mention his friend's profession. If he was a lawyer one thinks more highly of the military authorities, for if all the lawyers in the country were breaking stones for roads, instead of splitting hairs, the country would be better governed, and the war would be sooner won.]

When it comes to putting an Army in the field, I am satisfied

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"	17	111.12	25.4	Central	"	20	178.	44.45	132/46	"	4	185.	55.	entral
"		72.39	12.7	Central	"	75	178.	31.75	132/46	"	18	178.	44.45	132/46
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575 x 60	14	150.	38.1	104/46	700 x 100	2	185.	55.	135/50	"	33	150.	38.1	Central
"	21	160.	28.	Central	"	4	185.	55.	Central	800 x 150	8	185.	55.	135/50
"	34	150.	31.75	104/46	"	18	178.	44.45	132/46	"	10	185.	55.	Central
600 x 75	14	150.	38.1	104/46	"	26	150.	40.	Central					
"	21	160.	28.	Central	"	33	150.	38.1	Central	900 x 200	42	185.	60.32	125/60
"	34	150.	31.75	104/46	"	38	185.	38.09	132/46	"	47	185.	55.	125/60
					"	66	178.	38.89	132/46					

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

that the sooner you call up all able-bodied fighting men with no exemptions, if possible, the better. What is the use of calling up men who are not able-bodied, who will never make fighting men, simply because you want to fill offices? You call one man up to do the work of a labourer or that of a clerk. You call a man up, and you do not think he is good enough for active service and you put him at road-making. The man costs the country about £10 per week. Directly you call him up you have broken up his home, and in a most vexatious manner, and without any intelligent foresight, you have lifted him perhaps from Scotland and dumped him down in Devon for no reason. Yet there are plenty of men who are prepared to come forward and do that labouring work for much less than £10 per week. Then you go and take a man who possibly has a game leg, and you incur another expenditure of £10 per week, and send him to address envelopes in an office, when you could get men galore at £2 per week or women at 15s. If the Government are trying to make a paper Army, perhaps there is something in it. I think the Conscription Act is excellent, and is necessary, absolutely necessary, for the winning of this war. But I think that the Government made a most serious muddle, and I do not think that anybody could have muddled it more than they have done.

Equality of sacrifice does not seem to have occurred to the Administration. I know of cases of men who should be called up under that Act who, just because they happen to know somebody who knew somebody else who put in a good word for them in the right direction, are, instead of being called up, making two or three or five times as much as ever they made before, because the other unfortunate man did not know somebody whose wife knew somebody at the front who knew somebody in the War Office, and who, therefore, had to go, most probably leaving home and children and family behind, while other men, bachelors, remain behind. That has got to be cleared up. It is a horrible, crying, cruel injustice, and the men of this country, who stand a very great deal, and who have stood a very great deal, and the women of this country, will not stand for that type of Act or for that administration very much longer.

GRAFT.

I heard a very great deal this afternoon about clothing . . . and yet I have not heard mentioned in this House the whole of this afternoon something more terrible than the clothing scandal. . . . That was the case I read only yesterday of the shells scandal, in which a foreman had forged the inspector's die, and had stamped dud shells, passing them through to the Army. As any Member of this House who has ever been identified with guns knows, a dud shell will kill a whole gun team. The men in France are looking to us to supply them with weapons to kill the Germans and not to murder themselves. Why did this man forge this die, this private mark, and pass through thousands of those dud shells? He gets run in, and what happens? The judge takes a very serious view of the case and gives him six months—six months for with malice aforethought being a potential murderer of the men who had gone out to save his home and country. . . . I am satisfied in my mind that if that case were more fully inquired into there were other men who should be put into the dock. . . .

Graft is rampant in this country. I know it. I have seen it, not in one case but in fifty cases. . . . I could give many cases of inspectors and viewers, showing how this graft grows. In the first instance we had a gigantic organisation built up for the production of war material. We went to the contractors and said, "We will send inspectors to spy on you." That was our first mistake. We said, "We do not trust you; you are a lot of dishonest scoundrels; you will sell us 'dud' goods, so we will send inspectors and viewers to see that the goods are all right." I do not suggest that the contractors of this country are the very best type of men to be found, but I do suggest that we should have had much less trouble if we had left it to their honour and their honesty, with a saving clause that there would be a heavy fine for every piece of bad material delivered, and personal punishment for a second offence.

Then we got a lot of young fellows, some of them bank clerks, some of them van boys, and God knows what other sorts of people, who knew nothing about the subject, and sent them down as inspectors. What was the result? I could give a list of twenty or fifty actual cases. These people go to the Admiralty or the War Office and want a job. They get a commission; they become what are called temporary officers, or temporary gentlemen, as the case may be. They are told to go to a factory, and they become viewers or inspectors of the product of some highly technical work. We do not consider it safe even to take an ordinary man out of the street and send him out to fight the Germans without training him for six or twelve months. That is simply to fight, which should be natural to all of us. Yet we take a bank clerk and expect him to give decisions on the quality of steel, or castings, or forgings, or stresses or strains, or on timber, without giving him anything except possibly a little book containing measurements and a micrometer which he does not know how to use.

What is the result? In many cases when these youngsters arrive

they are very humble. The contractor meets them on level ground. He says, "This man will have it in his power either to mess up my business or to pass my stuff, so I will make a friend of him." He proceeds to make a friend of him. He asks him to dinner, or to have a drink; then he lends him his car. In many cases—I do not say in all—the contractor thinks: "Either I have to put this young fellow under social and financial obligation to me, or I have to put up with his trying to do his duty. In efforts to do his duty, which he does not understand, he will cause me endless bother and nuisance. If we get to know each other and become good friends, possibly he will take my advice or that of my viewers as to what he should pass and what he should not."

So before very long corruption sets in. When an inspector, no matter who he is, finds himself borrowing a contractor's car, borrowing petrol for his own cycle-car, and forgetting to give it back, dining at the Piccadilly or the Ritz, the Savoy or the Carlton, where I have seen them night after night, when before he had never been out of Soho or Poplar, when he gets his stomach well lined with the contractor's dinner and his head a little flushed with the contractor's wine, what sort of decisions can he give? That is the trouble.

[One has more than suspicions that graft goes further than these youngsters. One has even heard of technical officers having an interest in firms in whose favour they can influence or place contracts.]

On one side we see some men piling up money, and on the other side men perhaps with their sons killed and their homes ruined. That sort of thing is not going to bring about a happy ending, or to pitch our tents much nearer home night by night. I say to the Government, if you cannot conduct the war with imagination, please see that it is conducted with honesty.

The Press of this country seems to devote itself every day to new theories of why Germany must lose, because she has done something. I very rarely read that we must win because we have done something.

TANKS.

The "Tank" itself was advocated when I happened to be at the Admiralty. That was in December, 1914. When at the outbreak of war one of the men who to a very great extent brought the idea came over from America—an Englishman—he was turned aside, and no heed was taken of some of his best ideas. These tanks are so secret that we must not publish a photograph of them, or know whether they are made out of steel or of sugar candy, and we must not be told anything about them—I suggest that the Germans have already captured several of them. I ask the Secretary to contradict that, because I have heard it stated that we have lost some of these tanks. If they are in the hands of the Germans, what is the use of keeping up this secrecy, this absolute official bunkum, which is exhausting the patience of the country?

This Cuffley airship business is another instance. Everybody who knows anything about airships is laughing over the stupendous and crass bluff that we are trying to make over that. We all know that that was not a Zeppelin. . . . Even if it were true it would be fatuous enough. When we do bring down a Zeppelin there is no reason to make all this song about it. The fact that Zeppelins can get back after they have raided this country, after two and a half years of war, the fact that one only is brought down out of ten is a far greater disgrace to us than the fact that we have brought one down is a credit to us. . . .

In two years' time, it may be, we shall turn round and say, "Yes, an airship fleet would help us now if we had started it two years ago." There is no man in this country now who will deny the priceless assistance that our meagre little air fleet has been to us on the Western front. There is no man who understands aviation, who has even a smattering of knowledge of war, who would not tell you, if we had started to build an air fleet two years ago, of the priceless assistance it would have been to us to-day. Of course it would! If we could put 10,000 or even 5,000 men in the air, if we could carry this war over the enemy's country, at the back of his fortifications, instead of simply squirting men against them like a spray against a rock, it would be well. . . .

THE R.N.A.S.

I would suggest to the Minister for War that it is not too late to start now to improve the position. It is never too late. We have the resources. We have the man-power—when it is properly employed. I believe we have the money. We certainly have the credit. . . .

In this country, at the present time, we have hundreds of men who are drifting about the streets doing nothing. Why? Because they are naval men and the military could not possibly work with the Navy! There is no reason why naval aeroplanes to-day should not undertake the defence of the country without interfering with the little part they are playing in the war. There are the men and the machines, and everything else. You could then leave the Royal Flying Corps to get on with the war in France.

I do ask the hon. Gentleman on the Front Bench representing the Air Service, I do not know to what extent, to consider these points. The Board continue to issue a great many communiqués. . . . The Army and the Admiralty still seem to issue their own

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	8.30 F.1	12.0 F.1			
15	1.0 M.1	5.0 M.1	5 1/4	PART	ORDER No.
	8.15 S.2	8.0 S.2			
8.30 S.2	12.0 S.2	9 1/2	PART	ORDER No.	
	8.0 M.4				8.0 M.4
8.30 M.4	12.0 M.4	9 1/2	PART	ORDER No.	
	1.0 M.4				5.0 M.4
6.0 TU.5	8.0 TU.5	9 1/2	PART	ORDER No.	
	8.30 TU.5				12.0 TU.5
1.0 W.6	5.0 W.6	9 1/2	PART	ORDER No.	
	8.0 W.6				8.0 W.6
8.30 W.6	12.0 W.6	9 1/2	PART	ORDER No.	
	1.0 W.6				5.0 W.6
6.0 TH.7	8.0 TH.7	9 1/2	PART	ORDER No.	
	8.30 TH.7				12.0 TH.7
1.0 F.7	5.0 F.7	9 1/2	PART	ORDER No.	
	8.0 F.7				8.0 F.7
Form 53			Total hours	52 3/4	DESCRIPTION OF WORK TO BE DONE
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Ordinary Time			52	45	Time Allowed
Overtime			2	3 1/2	
TOTAL					Time Allowed Each Hour Piece
A.M. indicated by index letter upright. P.M. indicated by index letter sideways.					Certified by
No. Scraped			No. End	Passed by	Time Taken
Cost Each			Bonus	Cost Each	Total Cost

without any regard whatsoever to each other. . . . Perhaps the hon. Gentleman will tell us just exactly where the influence of the Air Board starts and where it finishes: where comes in its advisory capacity, and whether it is allowed to dictate. If the Air Board is purely in existence in an advisory capacity, you can take it from me that its advice is not worth anything. If it can dictate there is so much good work to be done. What I should like to say by way of suggestion to the Air Board is to discover to what extent they can dictate. I am afraid it is purely there as a name and not as a real thing.

Under these circumstances I appeal to His Majesty's Government to put the control of the future Air Service in the hands of young men of imagination, and let them not only win their spurs but let them win for the country, through the squadrons of the air, in perhaps the year or two of war which we will yet have to face, what no other weapon that has ever been put into our hands can accomplish.

Major Baird (representing the Air Board): Deeds count more than words in matters of war, and I do not think anybody who has followed the deeds of our aviators either at home or at the front will have cause to complain in the manner in which the hon. Gentleman who has just spoken has complained.

I do not believe we could have too many aircraft. At least it is impossible to conceive conditions which would enable us to obtain more than we could use with very great success. But I must ask him to believe that both the Naval Service and the Royal Flying Corps are doing their very utmost to obtain aircraft, and that when he considers the small beginnings with which we started the war, the fact that the expansion of the Air Service has been able to keep pace with the astounding expansion of the Army, and, at the same time, to win and retain the supremacy of the air, which is undeniable, at the front, disposes, I think, of the suggestion that there has been a slackness in the matter of developing the construction of aeroplanes.

Doubtless, the hon. Member is aware of the enormous wastage which occurs in the conditions of active service. It is something appalling, and to make good that wastage, to keep up-to-date in the matter of new inventions and improvements, to supply the great expansion which is required—all that has entailed an immense amount of forethought and hard labour on the part of the officers who, long before the Air Board had anything to do with the business, had been in charge of the thing. I think their achievement reflects very, very great credit upon them, and the hon. Member perhaps forgot that when he delivered strictures which we in this House are quite ready to accept, but which I do not think he applied to the officers, who cannot answer for themselves, and whose work has been too splendid for words.

[An oratorical red herring across the trail. The officers now in charge are putting right the things that Mr. Billing criticised.]

I do not think the experts of our Air Service deserve blame. Indeed, they deserve very great praise for the manner in which they have carried out this work.

[Then why have most of these "experts" at last been put under the control of a real engineer?]

With regard to the hon. Member for Hertford (Mr. Billing), I really wonder if there is anything to please him at all. Apparently there is nothing with which he is satisfied. Really, I cannot understand his frame of mind. With regard to his statement there was no excuse for Zeppelins getting back to their country, does he honestly think that that is the proper way to describe or refer to the deeds of those gallant aviators who go up night after night to destroy Zeppelins? How many has he destroyed himself?

[He has been responsible for the destruction of the equivalent of one, anyhow.]

Mr. Billing: Is that a question to ask? I consider it perfectly extraordinary, under all the circumstances of the material assistance given, that they have done such astounding deeds of heroism and efficiency.

Major Baird: I am very glad to have that admission from the hon. Member. The hon. Member talks of handing over the air defence of the country to the naval aviators. Why the very name "Naval Air Service" shows that it exists for naval purposes.

Mr. Billing: For the defence of the country, like the Navy; for protection from invasion.

Major Baird: The Navy does not defend the country on land, but on the sea, and it is to assist the Navy in protecting the country on the sea that the Naval Air Service is detailed, and it seems a very logical attitude to adopt. At any rate, it was the attitude adopted some time ago.

[No; it was not! The Army only took over aerial defence a few months ago, when the R.N.A.S. failed to make good.]

Anti-aircraft guns, searchlights, and aeroplanes are all combined in a carefully thought out plan, and that plan, as I said before the Recess, is by no means complete. It is improving every day, and if we adopted the attitude that that plan should be completed at a rate which would make it indispensable to deprive our forces at the front of the support they require, both in anti-aircraft guns and aeroplanes, I do not think that is the view which would commend itself to any but a very small minority of people in the country.

Mr. Billing: I suggest you should take up your Army aeroplanes for employment in France and employ naval aeroplanes, which are doing nothing in England, for the defence of the country.

Major Baird: It is very easy for somebody who has no inside knowledge of the organisation of the Army Service to suggest that the whole thing could be upset and altered, but I think the House would believe that these matters are carefully considered by those who are responsible, and they are at least as anxious as the hon. Member for East Herts that the defences of the country should be efficient, and if those defences were really as simple as the hon. Member suggests we should be given credit for carrying them out. [Things were "upset and altered" a few months ago, when air defence was taken away from the Navy.]

The speeches which the hon. Member for East Herts makes create a feeling, which is totally unjustified, that the Government are deliberately shirking the task of defending us against aircraft attacks. I do not think the hon. Gentleman intends to create that impression, because it is one which it is not fair or right to create in the minds of the people, who have nothing to go by except the speeches of the hon. Member, which are very much more widely reported than my own speeches or anybody else's. Before making those speeches he might at least think twice or three times, and endeavour to put himself in the position of those responsible for the defences, and give them credit for doing their best under the circumstances.

[As a matter of fact, Mr. Billing's speeches create a feeling that the Government is grossly and fatuously incompetent, which about agrees with the feelings of most intelligent men. Also Mr. Billing's speeches are less widely reported than those of the ordinary politician, so Major Baird is badly out in his facts.]

GUNS v. BOMBS.

An interesting addition has been received in Paris to the report of General Sigt von Arnim with reference to the supremacy of the Allies on the Somme over the Germans. It originates from the Staff of the Seventeenth German Army Corps, and among other points mentioned are the following:

"The fire of the enemy artillery and trench mortars has been extremely well directed by aeroplanes and balloons. The enemy aviators flew very low above our positions, and thus could determine exactly the portions of positions or batteries that were not yet destroyed, with the result that fire was immediately directed on these points. The low level at which the aviators flew was proved by the fact that some machines were brought down by infantry.

"It is no longer possible to hold villages under the fire of the new heavy artillery of the enemy. . . . Positions and trenches intended to be held should be far away from any village. The enemy artillery has fired excellently by means of the map, without observations made either by aeroplanes or captive balloons, on important points, even though far away. Railway stations and bridges as much as seven miles behind the front have been hit at the first shot by most accurate fire."

The latter paragraph of the quotation rather confirms the unwisdom of sending aeroplanes over the lines to bomb places which are within reach of artillery fire. This point has been discussed several times in THE AEROPLANE, and one gathers that less of such bombing has been done of late.

It seems fairly obvious that while one aeroplane can range a couple of batteries of "heavies" onto a given point while they pour tons of shells into it, there is little use in sending aeroplanes to do the same work. The aeroplane's bombing should only begin where the range of the gun ceases.—C. G. G.

THE INCREDULOUS BOCHE.

Among a batch of German wounded arriving last week at Charing Cross was a man who stared about him curiously. He spoke a little English.

"Var are ve?" he asked of a Red Cross officer.

"Charing Cross," was the answer.

"Ach, nein!" said the puzzled and incredulous Boche. "Charring Cross! Lon-don! Nein! Ze Zeppelens! Lon-don ees not."

His English was not equal to explaining that he knew London in general and Charing Cross in particular had been reduced to ruins long since.—E. S.

AN AIRSHIP NUMBER.

On November 1st THE AEROPLANE will issue a special Airship Supplement to the ordinary number of the paper. By courtesy of the Air Department of the Admiralty it has been possible to make a detailed examination of one of the Zeppelins recently brought down, and in consequence many particulars of the latest type airship are now available which have hitherto been unpublished.

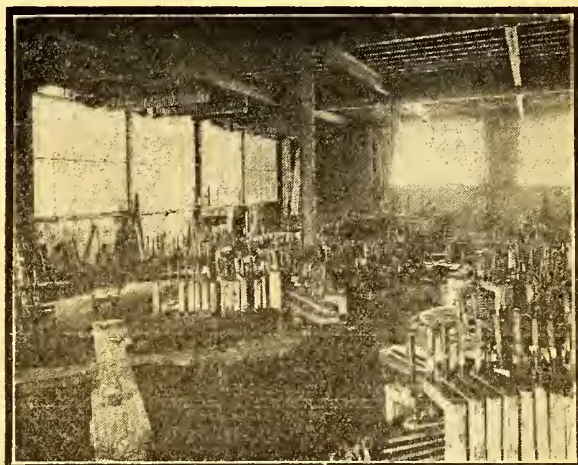
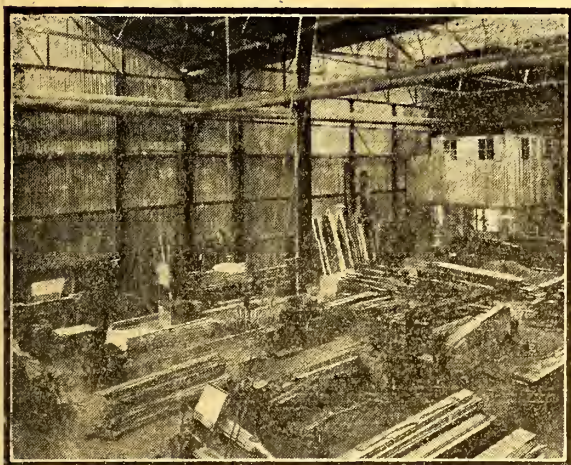
The occasion seems fitting to publish at the same time a history of airships in general, and to illustrate the various more or less successful types, from the earliest days of petrol-driven aircraft.

There will be a big demand for this issue, so it will be advisable to order copies well in advance.

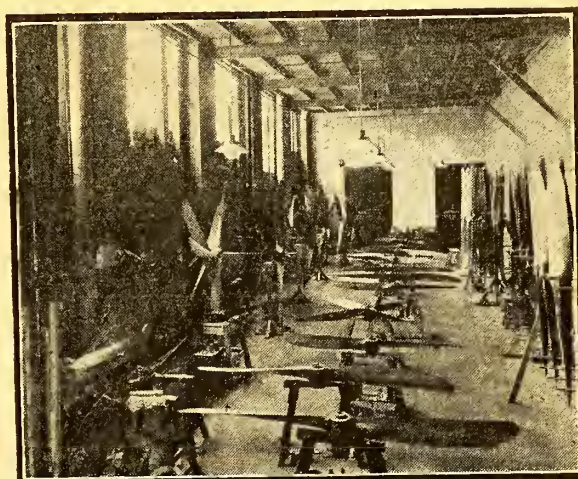
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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Oct. 10th, 1916.

WAR OFFICE, Oct. 10th.

REGULAR FORCES.—**COMMANDS AND STAFF.**—Temp. appts. made at War Office.—Staff Capt. : Capt. C. F. Krabbé, T.F. Res., from Staff Lt. vice Maj. I. M. Bonham-Carter, Northd. Fus., Sept. 28th, 1916.

Staff Lt.-Capt. H. P. R. Coode, Res. of Officers, vice Capt. C. F. Krabbé, T.F. Res., Sept. 28th, 1916.

ESTABLISHMENTS.—R.F.C.—Flying Officers.—Temp. Sec. Lt. C. J. Truran, Gen. List, June 28th. Temp. Lt. J. E. H. Dakin, Motor Machine Gun Corps, and to be transfd. to Gen. List; temp. Sec. Lt. T. Langwill, High. L.I., and to be transfd. to Gen. List; Sec. Lt. (on prob.) H. J. Gearing, High. L.I., Spec. Res., and to be sec'd.; Sec. Lt. (on prob.) A. N. David, Spec. Res.; temp. Sec. Lt. (on prob.) J. V. Lyle, Gen. List, Sept. 15th. Temp. Lt. W. F. W. Hills, R.A., and to be transfd. to Gen. List; Sec. Lt. N. Middlebrooke, Rif. Brig., Spec. Res., and to be sec'd.; Sec. Lt. N. H. Read, Spec. Res.; temp. Sec. Lt. T. E. Duffy, Lan. Fus.; temp. Sec. Lt. O. F. G. Ball, R. Suss. R.; and to be transfd. to Gen. List; Sec. Lt. E. E. Glorney, Spec. Res.; Sec. Lt. G. L. Rodwell, Spec. Res., Sept. 16th. Sec. Lt. (temp. Capt.) I. A. J. Duff, Dorset R., T.F.; temp. Lt. C. Fairbairn, Gen. List, from a Flying Officer (Observer), with seny. from May 30th. Temp. Sec. Lt. (on prob.) J. E. B. Thornely, Suff. R., and to be transfd. to Gen. List, Sept. 18th. Lt. (temp. Capt.) D. M. Stewart, R. Scots, T.F.; Sec. Lt. J. F. Lawson, S. Mid. (Warwick) R.G.A., T.F.; Sec. Lt. (on prob.) P. B. Pattison, Spec. Res.; Sec. Lt. (on prob.) J. B. Ackroyd, Spec. Res., Sept. 19th. Sec. Lt. (temp. Lt.) C. Butler, W. Rid. R.E., T.F.; temp. Sec. Lt. J. W. Baker, E. Surr. R., and to be transfd. to Gen. List; Sec. Lt. E. G. E. Donaldson, R.F.A., Spec. Res.; Sec. Lt. (on prob.) W. G. Helpman, 2nd Regt., King Edward's Horse, and to be sec'd., Sept. 20th.

Balloon Officers.—Lt. R. Wilkinson, S. Staff. R., T.F., Sec. Lt. (on prob.) C. H. Knight, Dorset R., Spec. Res., and to be sec'd., Sept. 23rd.

MEMORANDA.—To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Pte. F. W. Poat, from A.S.C., Sept. 10th. Pte. W. C. Faull, from R.A.M.C., Sept. 16th. 1st Cl. Air Mech. H. W. Armstrong, from R.N.A.S., Sept. 25th.

SPECIAL RESERVE OF OFFICERS.—**SUPPLEMENTARY TO REGULAR CORPS.**—R.F.C.—The undermentioned Sec. Lts. (on prob.) resign their commns.:—C. H. Biddlecombe, S. L. Hollis, Oct. 11th.

Sec. Lt. (on prob.) W. E. M. Walker is confirmed in his rank. L. B. W. Jolley to be Sec. Lt., Sept. 14th.

To be Sec. Lts. (on prob.):—J. F. C. Bell, Sept. 17th. C. A. Brown, Sept. 25th. C. W. Olliver, Sept. 28th. E. I. David, Oct. 1st.

TERRITORIAL FORCE.—**INFANTRY.**—**LOYAL NORTH LANCASHIRE REGT.**—Sec. Lt. F. W. Musson is sec'd. for duty with the R.F.C., Sept. 12th.

HIGH. CYCLIST BN.—The following officers are sec'd. for duty with the R.F.C.:—Capt. G. B. Lockhart, Sept. 23rd. Sec. Lt. (temp. Lt.) W. E. Grosset, June 21st.

R. SCOTS.—Sec. Lt. W. C. Thomas is sec'd. for duty with the R.F.C., Sept. 25th. Lt. (temp. Capt.) D. M. Stewart is sec'd. for duty with the R.F.C., Sept. 19th.

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From the "London Gazette" Supplement, Oct. 11th, 1916.

WAR OFFICE, Oct. 11th.

REGULAR FORCES.—**ESTABLISHMENTS.**—R.F.C.—Comdts. of Schools of Instn., Staff Officers, 1st Cl.—(Graded for pay as A.A.Gs.)—Maj. C. Saunders, D.S.O., Dorset R., and Maj. I. M. Bonham-Carter, Northd Fus., and to be temp. Lt.-Cols. whilst so emp'd., Sept. 28th.

Park Comdr.—Temp. Lt. (temp. Capt.) A. Cleghorn, 1st Highland Fd. Co., R.E., T.F., from an Equipment Officer, and to be temp. Maj. whilst so emp'd., Sept. 20th.

Sqdn. Comdr.—Capt. C. T. Maclean, R. Sc. Fus., from a Flt. Comdr., and to be temp. Maj. whilst so emp'd., Sept. 1st.

Flight Comdrs.—From Flying Officers.—Capt. J. E. Dixon-Spain, Hamps. R., Aug. 23rd. Lt. E. R. Pretymann, Som. L.I., and to be temp. Capt. whilst so emp'd., Sept. 27th.

Equipment Officer, 1st Class.—And to be temp. Capt. whilst so emp'd.—Temp. Sec. Lt. N. F. D. Buckeridge, Gen. List, from a Flying Officer, Sept. 8th.

Flying Officers.—Temp. Sec. Lt. F. Crisp, Gen. List, Sept. 18th. Sec. Lt. (temp. Lt.) G. S. Buck, Lond. R., T.F., Sept. 21st. Temp. Capt. J. W. W. Nason, R. Suss. R., and temp. Sec. Lt. A. H. Gearing, R. Fus., and both to be transfd. to Gen. List, Sept. 22nd.

Flying Officers (Observers).—Sec. Lt. A. V. McKiever, Sea. Highrs., and to be sec'd., Feb. 13th. Sec. Lt. (temp. Lt.) L. Walmsley, E. York R., Spec. R., Feb. 14th. Sec. Lt. G. St. V. Pawson, Westmorland and Cumberland Yeo., T.F., Feb. 15th.

Temp. Lt. S. H. Hewett, Gen. List, July 14th. Temp. Sec. Lt. A. E. Kennedy, Gen. List, July 25th. Lt. F. S. Rankin, Canadian Engrs., Sept. 18th. Capt. A. L. Taylor, 28th Canadian Inf. Bn.; temp. Sec. Lt. E. V. D. Mathews, D. of Corn. L.I., and to be transfd. to Gen. List; temp. Sec. Lt. W. G. Barker, Gen. List, Sept. 22nd. Temp. Sec. Lt. C. Courtneidge, Som. L.I., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) J. S. Williams, Gen. List, Sept. 23rd.

Asst. Equipment Officers.—Temp. Capt. (Qr.-Mr. and Hon. Lt., R.A.M.C., T.F.) H. S. Cleghorn, R.E.; temp. Sec. Lt. G. K. Shepherd, Gen. List; temp. Sec. Lt. D. B. Cleghorn, Gen. List, Aug. 31st. Sec. Lt. L. B. W. Jolley, Spec. Res., Sept. 14th. Sec. Lt. (temp. Lt.) E. Gayton, R.A., and to be sec'd. Sec. Lts. (on prob.), Spec. Res.—P. R. Hutchinson, T. T. Cumming; Sec. Lt. H. E. Steinberg, Spec. Res. Sec. Lts. (on prob.), Spec. Res.—A. L. Challis, W. F. J. Matthews; temp. Sec. Lt. G. M. J. Denman, Gen. List. Sec. Lts. (on prob.), Spec. Res.—A. E. Biggs, H. I. Allen, E. M. Leete, A. D. Robertson, Sept. 18th.

MEMORANDA.—Wt. and N.C.Os. from R.F.C. to be Sec. Lts. for duty with R.F.C.:—Sgt.-Maj. H. C. Williamson, June 22nd. Act. Sgt.-Maj. F. Petch, Flt. Sgt. W. Millett, June 23rd. Sgt.-Maj. L. Auken, Act.-Sgt.-Maj. W. H. Clover, July 1st. Sgt.-Maj. J. F. Street, Act. Sgt.-Maj. J. H. Winch, Act. Sgt.-Maj. H. Jones, July 10th. Flt. Sgt. F. Pratt, Oct. 1st. Sgt.-Maj. J. Rigby, Sgt.-Maj. O. W. Latimer, Act. Sgt.-Maj. W. Sharp, Act. Sgt.-Maj. W. G. Stafford, Act. Sgt.-Maj. C. L. Archbold, Act. Sgt.-Maj. W. C. Clark, Act. Sgt.-Maj. J. Rylands, Flt. Sgt. F. R. Wilkins, Flt. Sgt. A. Hawley, Sgt. D. A. R. Chapman, 1st Cl. Air Mech. F. G. Webber, Oct. 12th.

N.C.Os., from R.F.C., to be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Flt. Sgt. E. F. Hall, Aug. 28th. Flt. Sgts.—E. Drudge, E. M. Cashmore, A. F. Lang. Sgts.—F. Grattan, R. G. Fussell. 1st Cl. Air Mechs.—E. R. Danks, J. O. Cooper; and Cl. Air Mech. C. Rayner, Oct. 12th.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Cpl. V. C. Legg, from Birmingham Univ. O.T.C., Sept. 11th. Pte. W. V. Radford, from Inns of Court O.T.C., Sept. 21st. Pte. P. G. White, from Lond. R., T.F., Sept. 30th. Act. Co. Sgt.-Maj. G. W. Y. Swanson, from A.O.C.; Oct. 8th.

SPECIAL RESERVE OF OFFICERS.—**SUPPLEMENTARY TO REGULAR CORPS.**—R.F.C.—Sec. Lts. to be Lts.:—D. B. James, C. C. Godwin, D. A. Hansard, G. de L. Wooldridge, W. N. M. Dunkley, Aug. 1st. (Temp. Capt.) S. C. Callaghan, (temp. Capt.) K. K. Horn, (temp. Capt.) A. T. Whitelock, R. G. Bennett, (temp. Capt.) J. H. Herring, G. G. Hubbard, C. W. Hill, J. G. Western, (temp. Capt.) R. F. S. Morton, V. D. Bell, G. Somers-Clarke, A. Charig, (temp. Capt.) W. P. Cort, E. H. Pullinger, M. Minter, L. A. McDougald, A. T. Thompson, E. Selby, (temp. Capt.) J. L. Chalmers, L. C. Kidd, (temp. Capt.) A. Heywood, (temp. Capt.) F. Shumaker, B. W. Watts, (temp. Capt.) B. May, T. W. Winter.

Christian names of Sec. Lt. (on prob.) Alfred Edwin McKay are as now described, and not as in "Gazette" of March 27th.

Notification in "Gazette" of Sept. 18th of appt. of C. G. Mallous as Sec. Lt. (on prob.) is cancelled.

Undermentioned Sec. Lts. (on prob.) are confirmed in their rank.—A. N. David, W. M. Carlyle, F. S. Schell, P. B. Pattison, H. E. Steinberg, J. B. Ackroyd, D. J. Bell, L. R. Kerridge, W. R. Bowick, N. E. Chandler, A. Carruthers, E. F. Nash, C. Musgrave, A. Clark.

To be Sec. Lts.:—F. W. Beard, Aug. 18th. C. B. Willcocks, Aug. 24th.

Undermentioned to be Sec. Lts. (on prob.):—C. B. Mulville, Sept. 21st. A. C. Day, Sept. 25th. A. T. Griffith, F. H. Jefferis, Sept. 30th. H. Townend, T. Tatton, Oct. 1st.

TERRITORIAL FORCE.—**YEOMANRY.**—**E. RID. OF YORKS.**—Sec. Lt. J. C. Smith is sec'd. for duty with the R.F.C., Sept. 30th.

* * *

From the "London Gazette" Supplement, Oct. 12th, 1916.

WAR OFFICE, Oct. 12th.

REGULAR FORCES.—**ESTABLISHMENTS.**—R.F.C.—Flight Comdrs.—From Flying Officers, and to be temp. Capts. whilst so emp'd.:—Lt. C. E. Wardle, Spec. Res., Sept. 6th. Temp. Sec. Lt. L. F. Forbes, Gen. List, Sept. 24th. Sec. Lt. H. A. Taylor, R.W. Kent R., Sept. 25th. Lt. C. H. Gardner, 1st Welsh (Howitzer) Brig., R.F.A., T.F., Sept. 29th.

Flying Officers.—Lt. C. R. O'Brien, R. Lanc. R., and to be sec'd., temp. Sec. Lt. E. B. Mason, Bord. R., and to be transfd. to Gen. List, Sept. 14th. Temp. Sec. Lt. J. V. Aspinall, Gen. List, Sec. Lt. M. Hayne, Lan. Fus., and to be sec'd., Sec. Lt. E. S. P. Hynes, E. Kent R., and to be sec'd., Sept. 17th. Sec. Lt. (on prob.) P. McL. Haarer, Spec. Res., Sept. 19th. Temp. Sec. Lt. K. B. Wild, R. Suss. R., and to be transfd. to Gen. List, Sec. Lt. L. C. F. Lukis, Essex R., and to be sec'd., Sept. 20th. Sec. Lt. N. E. Chandler, Spec. Res., Sept. 21st. Temp. Lt. F. J. Roberts, Gen. List, from a Flying Officer (Observer), with seny. from Feb. 12th. Temp. Sec. Lt. (temp. Lt.) J. A.

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Barton, Gen. List, from a Flying Officer (Observer), seny. from April 1st. Sec. Lt. S. A. Sharpe, R.A., from a Flying Officer (Observer), seny. from May 4th. Sec. Lt. E. R. Davis, Worc. R., from a Flying Officer (Observer), seny. from May 29th, Sept. 22nd. Lt. (temp. Capt.) G. B. Lockhart, Highland Cyclist Bn., T.F.; Sec. Lt. H. A. Prosser, North'n. R., and to be secd.; Sec. Lt. C. Musgrave, Spec. Res.; temp. Sec. Lt. E. Nightingale, E. Kent R., and to be transfd. to Gen. List; temp. Sec. Lt. J. H. Tyler, K.R. Rif. C., and to be transfd. to Gen. List; Sec. Lt. A. C. Woodman, Lond. R., T.F.; temp. Sec. Lt. (on prob.) G. Douglas, High. L.I., and to be transfd. to Gen. List; temp. Sec. Lt. H. Kirton, Gen. List; Sec. Lt. E. C. H. R. Nicholls, R. W. Surr. R., and to be secd., Sept. 23rd.

Adjts.—From Asst. Equipment Officers:—Temp. Lt. R. C. Lane, Lt. G. C. Gold, Spec. Res., Sept. 15th.

Equipment Officers, 2nd Cl.—From Asst. Equipment Officers:—Lt. W. H. Day, Hamps. R., Sec. Lt. S. Davenport, Spec. Res., and to be temp. Lt. whilst so empld.; Sec. Lt. W. J. Sinclair, Spec. Res., and to be temp. Lt. whilst so empld., Sept. 26th.

LABOUR BATTALIONS.—GENERAL LIST.—Cdt. J. A. Dales to be temp. Sec. Lt. (on prob.) for duty with the R.F.C., Aug. 5th.

MEMORANDUM.—Pte. L. C. Welford, from 2nd Canadian Divl. Supply Col., to be temp. Sec. Lt. for duty with R.F.C., Oct. 2nd.

TERRITORIAL FORCE.—R.F.A.—WESSEX BRIGADE.—Lt. C. de P. D. Swain is now secd. for duty with the R.F.C., Sept. 28th.

From the "London Gazette" Oct. 13th, 1916

WAR OFFICE, Oct. 13th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdrs.—From Flying Officers, and to be temp. Capts. whilst so empld.:—Lt. W. L. Robinson, V.C., Worc. R.; Sec. Lt. A. de B. Brandon, D.S.O., Spec. Res., Sept. 1st.

From Flying Officers:—Capt. G. W. D. Allen, L'pool R., Spec. Res., Sept. 23rd. Sec. Lt. (temp. Lt.) G. W. Roberts, R.F.A., Spec. Res., and to be Capt. whilst so empld., Sept. 27th.

Equipt. Officer, 1st Cl.—Qrmr. and Hon. Lt. S. J. Payne, R.F.C., from Adjnt., and to be temp. Capt. whilst so empld., Sept. 1st.

Flying Officers.—Sec. Lt. (on prob.) A. E. Neal, Spec. Res., Sept. 21st. Sec. Lt. C. Parkinson, E. Lan. R., T.F., Sec. Lt. W. L. Wells, Midd'x R., T.F., Sec. Lt. L. H. Julk, N. Staff. R., Spec. Res., and to be secd., Sec. Lt. P. L. Stephens, Welsh R., T.F., Temp. Sec. Lt. T. S. Stewart, R. Suss. R., and to be transfd. to Gen. List, Sec. Lt. W. R. Bowick, Spec. Res., Lt. A. C. Maund, 8th Canadian Inf. Bn., from a Flying Officer (Observer), seny. from May 31st, Lt. F. Workman, R. Ir. Rif., Spec. Res., and to be secd., temp. Sec. Lt. G. C. Hoskins, Gen. List, Sec. Lt. D. J. Beil, Spec. Res., Sec. Lt. (on prob.) C. Kennard, Spec. Res., Sept. 22nd. Sec. Lt. O. M. Sutton, S. Lan. R., Spec. Res., and to be secd., Sept. 23rd. Lt. C. S. Morice, Worc. R., and to be secd., Sec. Lt. J. N. K. Shepherd, North'n R., Spec. Res., and to be secd., Sec. Lt. A. Carruthers, Spec. Res., Sept. 24th. Temp. Lt. H. D. Harman, Glouc. R., and to be transfd. to Gen. List, temp. Sec. Lt. C. O. Bean, Dorset R., and to be transfd. to Gen. List, temp. Sec. Lt. V. H. Baker, R. Welsh Fus., and to be transfd. to Gen. List, Sept. 25th.

Flying Officers (Observers).—Temp. Capt. A. W. Field, Machine-gun Corps, and to be transfd. to Gen. List; Sec. Lt. (temp. Lt.) P. C. Purser, A.S.C., T.F.; temp. Sec. Lt. W. O. Thomas, R. W. Fus., and to be transfd. to Gen. List; Sec. Lt. (on prob.) A. J. Bott, R.G.A., Spec. Res.; temp. Sec. Lt. (on prob.) H. Good, Midd'x R., and to be transfd. to Gen. List, Sept. 26th. Lt. F. G. B. Reynolds, Oxf. and Bucks. L.I., T.F.; temp. Lt. G. M. Garro-Jones, S. Wales Bord., and to be transfd. to Gen. List; temp. Lt. C. C. Statt, Oxf. and Bucks. L.I., and to be transfd. to Gen. List; Sec. Lt. J. M. Stubbs, 3rd Hrs., and to be secd.; temp. Sec. L. R. M. Collingwood, York. and Lanc. R., and to be transfd. to Gen. List; Sec. Lt. L. H. Scott, Midd'x R., T.F.;

temp. Sec. Lt. W. F. Findlay, K.O. Sco. Bord., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) D. P. Cox, Gen. List, Sept. 27th.

Adjnt.—Capt. J. C. R. Gannon, 23rd Cav., Ind. Army, vice Qrmr. and Hon. Lt. (temp. Capt.) S. J. Payne, R.F.C., Sept. 1st. Equipment Officers, 3rd Cl.—Sec. Lt. A. Clark, Spec. Res.; Sec. Lt. (on prob.) J. M. Heesem, Spec. Res., Sept. 1st. Sec. Lt. (temp. Capt.) C. Higham, Manch. R., T.F.; temp. Sec. Lt. W. H. Tyler, Worc. R., and to be transfd. to Gen. List; Sec. Lt. (on prob.) N. Greenwell, Spec. Res.; temp. Sec. Lt. (on prob.) H. S. Hawkes, Midd'x R., and to be transfd. to Gen. List; temp. Sec. Lt. W. E. Phillips, Gen. List; Sec. Lt. (on prob.) E. F. Cameron, Spec. Res.; Sec. Lt. (on prob.) T. Woodman, Spec. Res.; temp. Sec. Lt. J. L. Dearing, Gen. List, Sept. 18th.

Labour Battalions.—General List.—H. B. Evans to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Aug. 5th.

MEMORANDA.—To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Sgt. L. P. Ball, from Lond. R., T.F., Sept. 25th. Cpl. C. F. Wormull, from Lond. Elec. Engrs., T.F., Oct. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—E. A. McKay, A. E. McKay.

TERRITORIAL FORCE.—YEOMANRY.—2ND LOVAT'S SCOUTS.—Sec. Lt. P. A. Russell is secd. for duty with the R.F.C., Sept. 25th.

R.G.A.—DEVON.—Lt. (temp. Capt.) T. F. Day is secd. for duty with the Anti-Aircraft Depot, Oct. 14th.

INFANTRY.—OXFORD AND BUCKS L.I.—Lt. F. G. B. Reynolds is secd. for duty with the R.F.C., Sept. 27th.

MIDD'X R.—Sec. Lt. L. H. Scott to be secd. for duty with the R.F.C., Sept. 27th.

E. LANCs R.—Sec. Lt. (temp. Lt.) N. Hargreaves is secd. for duty with the R.F.C., Sept. 26th.

ARMY SERVICE CORPS.—WESSEX DIVL. TRAIN.—Sec. Lt. (temp. Lt.) P. C. Purser is secd. for duty with the R.F.C., Sept. 26th.

* * *

The "London Gazette" of Oct. 13th contains Lieut.-General Sir Percy Lake's dispatch relative to the operations in Mesopotamia from Jan. 19th to April 30th. The period includes three phases in the further attempt to relieve Kut. The following reference to aircraft appears:—

Third Phase (March 11th to April 30th).

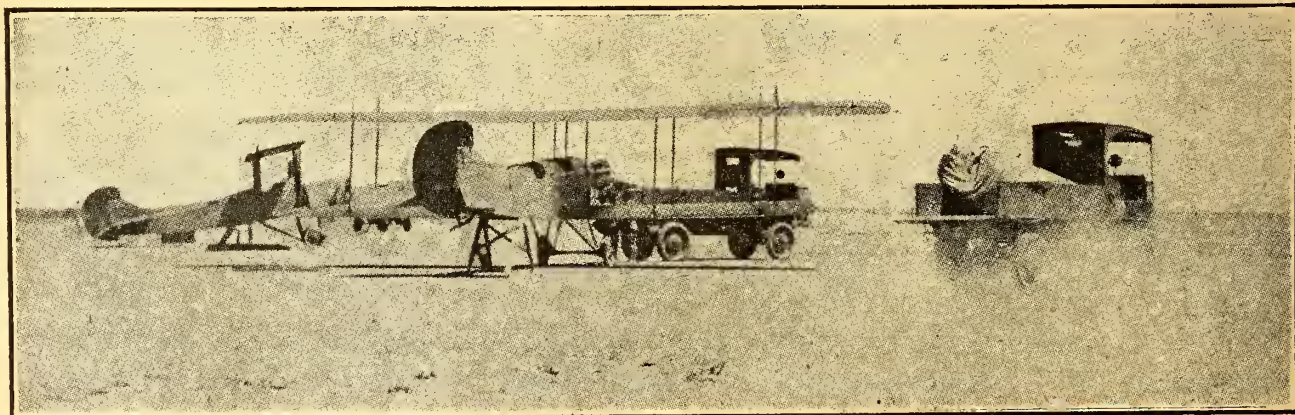
In the hope of prolonging the resistance of Kut for even a day or two, the Royal Flying Corps and Royal Naval Air Service had dropped into Kut, between April 16th and April 29th, approximately eight tons of supplies, besides fishing nets, medicines, and specie. Although these supplies could not materially alter the course of the siege, it was a performance which is deserving of high praise, for it involved a great strain on the pilots, and the journeys were subject to attacks by enemy aircraft of superior speed and fighting capacity. One of our machines was shot down while engaged on this supply service, another was damaged, but brought home safely with great skill.

[Those who disbelieved the criticisms of this paper on the quality of aircraft supplied to the R.N.A.S. and R.F.C. may be interested in the statement that the enemy's aircraft were of "superior speed and fighting capacity."—Ed.]

* * *

From the "London Gazette" Supplement, Oct. 13th, 1916.

The King has been graciously pleased to appoint Sec. Lt. WULSTAN JOSEPH TEMPEST, General List and Royal Flying Corps, a Companion of the Distinguished Service Order, in recognition of conspicuous gallantry and devotion to duty in connection with the destruction of an enemy airship.



Two Curtiss Biplanes on the Mexican Frontier, with Humphries "Quads" in attendance as supply wagons.

For Rapid Construction

Aeroplane Factories, Works Extensions, Hangars and Sheds, Munition and Factory Buildings, constructed in Steel, Brick, Concrete, Timber, Slabs, etc. In emergency cases, Designs, Specifications and Estimates supplied in 24 hours.

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From the "London Gazette" Supplement, Oct. 14th, 1916.

WAR OFFICE, Oct. 14th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdrs.—From Flying Officers, and to be temp. Cpts. whilst so empld.:—Lt. R. H. B. Ker, 3rd Pioneer Bn., Canadian Expeditionary Force, Sec. Lt. K. H. Riversdale-Elliott, Sco. Rif., Sec. Lt. E. G. Landon, Spec. Res., Oct. 1st. Sec. Lt. (temp. Lt.) C. M. Leman, Essex and Suff. R.G.A., T.F., Oct. 2nd. Sec. Lt. S. E. Cowan, Spec. Res., Oct. 3rd.

Flying Officers.—Sec. Lt. C. A. Pike, Spec. Res., Sept. 20th. Sec. Lt. O. B. Howell, Spec. Res., Sept. 23rd. Sec. Lt. (on prob.) E. B. Cahusac, S. Staff. R., Spec. Res., and to be sec'd.; Sec. Lt. (on prob.) F. Williams, Spec. Res., Sept. 24th. Lt. J. S. Hodges, R. Fus., Spec. Res., and to be sec'd.; temp. Lt. B. D. Willoughby, A.S.C., and to be transf'd. to Gen. List; temp. Sec. Lt. (temp. Lt.) W. Baillie, Gen. List, from a Flying Officer (Observer), seny. April 1st. Sec. Lt. P. A. Russell, 2nd Lovat's Scouts Yeo., T.F.; Sec. Lt. (temp. Lt.) H. W. McGowan, K.O. Sco. Bord., T.F.; Sec. Lt. W. C. Thomas, R. Scots, T.F.; temp. Sec. Lt. R. K. Morris, Durh. L.I., and to be transf'd. to Gen. List; temp. Sec. Lt. J. A. Kirker, Gen. List; temp. Sec. Lt. S. H. Preston, Gen. List; Sec. Lt. G. S. McGregor, Spec. Res., Sept. 25th. Sec. Lt. (temp. Lt.) N. Hargreaves, E. Lan. R., T.F.; temp. Sec. Lt. K. Crawford, Machine Gun Corps, and to be transf'd. to Gen. List; temp. Sec. Lt. (on prob.) C. A. Brown, Gen. List; temp. Sec. Lt. (on prob.) J. H. R. Sutherland, Gen. List, Sept. 26th. Temp. Sec. Lt. J. C. C. Affleck, York R., and to be transf'd. to Gen. List; temp. Sec. Lt. E. L. Zink, Suff. R., and to be transf'd. to Gen. List; temp. Sec. Lt. (on prob.) E. T. Dunford, Gen. List, Sept. 27th.

Equpt. Officer, 2nd Cl.—Sec. Lt. E. E. Robb, Spec. Res., from an Asst. Equpt. Officer, and to be temp. Lt. whilst so empld., Sept. 26th.

Equpt. Officer, 3rd Cl.—Sec. Lt. (on prob.) A. V. Sutton, R.G.A., Spec. Res., Sept. 18th.

MEMORANDA.—Temp. Sec. Lt. E. V. D. Mathews, D. of Corn. L.I., to be transf'd. to Gen. List, and to be temp. Lt. whilst serving with R.F.C., Sept. 1st.

The following Sec. Lts. to be temp. Lts. whilst serving with R.F.C.:—S. E. Pither, K.O. Sco. Bord., R. H. Peto, 10th Hrs., J. H. Mansfield, Shrops. L.I., A. H. Goldie, Bedf. R., K. H. Riversdale-Elliott, Sco. Rif., B. H. Beanlands, Hamps. R., W. McKay, Sea. Highrs., A. L. Macdonald, R. Highrs., A. J. G. Styran, R.F.A., H. R. D. Simpson, 6th Dns., M. H. Strange, R. Fus., D. H. De Burgh, R.A., Sept. 1st.

Sec. Lts., Spec. Res., to be temp. Lts. whilst serving with R.F.C.:—S. L. Pettit, R. Fus., F. W. Morter, R. War. R., T. R. Irons, York and Lanc. R., J. C. Hodges, R.G.A., E. M. Gilbert, Essex R., A. G. D. Gavin, R. Highrs., F. St. J. F. N. Echlin, R. Fus., C. F. Denning, R. W. Surr. R., P. C. Campbell, Arg. and Suth'd Highrs., C. L. Bullock, Rif. Brig., E. L. B. Buchanan, R.F.A., A. J. Bott, R.G.A., G. K. Macdonald, Notts and Derby R., G. A. Turner, Dorset R., V. A. Stookes, 2nd Dns., E. W. Edwards, R. W. Surr. R., Sept. 1st.

Temp. Sec. Lts. to be temp. Lts. whilst serving with R.F.C.:—S. F. P. Polhill, R.E., C. C. Miller, W. Rid. R., V. A. Strauss, A.S.C., Sept. 1st.

Temp. Sec. Lt. (on prob.) J. V. Lyle, Gen. List, is confirmed in his rank.

Sec. Lt. (on prob.) H. C. Short, from R.F.C., Spec. Res., to be temp. Sec. Lt. on Gen. List for duty with R.F.C., July 22nd.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. H. M. Fleming relinquishes his commn. on appt. to R.N.V.R., Sept. 30th. Sec. Lt. (on prob.) the Hon. C. E. St. G. Caulfield relinquishes his commn. on account of ill-health, Oct. 15th.

The following resign their commns.:—Sec. Lt. G. G. Samuel, Sec. Lt. J. E. Fitzsimons, Sec. Lt. (on prob.) M. Hughes, Sec. Lt. (on prob.) G. Smith, Oct. 15th.

The following Sec. Lts. (on prob.) are confirmed in their rank: O. B. Howell, F. B. B. Shand, A. E. Neal, E. F. Cameron, G. S. Macgregor, R. W. Mitchell, C. A. Pike, M. R. Grover, A. C. Smith, G. H. Warneken, H. W. Robinson.

To be Sec. Lts. (on prob.):—G. F. Harmer, Oct. 2nd. N. H. England, Oct. 9th.

TERRITORIAL FORCE.—INFANTRY.—LONDON R.—Sec. Lt. J. H. Rutherford is sec'd. for duty with the R.F.C., Dec. 20th.

* * *

From the "London Gazette" Supplement, Oct. 16th, 1916.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdrs.—Maj. E. H. M. O'Farrell, R. Ir. Fus., from a Flying Officer (Observer), June 29th.

From Flying Officers, and to be temp. Cpts. whilst so empld.:—Sec. Lt. A. L. Gordon-Kidd, D.S.O., 4th D.G., Oct. 2nd. Sec. Lt. L. F. Hursthouse, Spec. Res., Sec. Lt. S. F. Heard, Spec. Res., Oct. 3rd. Lt. J. D. Latta, Spec. Res., Oct. 4th.

INFANTRY.—W. RID. R.—Sec. Lt. E. E. Bush is sec'd. for service with R.F.C., Oct. 3rd.

S. LAN. R.—Sec. Lt. A. G. Bond is sec'd. for service with R.F.C., Oct. 3rd.

MEMORANDA.—The undermentioned to be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Cpl. W. M. Edwards, from Lond. Brig., R.F.A., T.F., Sept. 4th. Gunner C. Rawdon-Schofield, from H.A.C., T.F., Oct. 7th. Qr.-Mr. and Hon. Lt. C. H. Leak, R.E., to be Hon. Capt., Oct. 17th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) resign their commns.:—S. Douglas, H. J. Every, Oct. 17th.

Sec. Lts. (on prob.) are confirmed in their rank:—R. E. Chaderton, P. McL. Haarer, F. H. Humphreys, D. K. Swoorde, H. C. Baker, G. Lea, C. E. S. Russell, N. Greenwell, W. E. Bousfield, F. Williams, J. Wheatland-Clinch, W. G. Cooke, E. M. A. Vander-Meersch, D. B. Thorp, H. Tallis, R. T. Royse, E. C. McKenzie-Martyn, G. E. Osmond, J. M. Heesem, C. S. Hickie, E. R. Yates, P. H. S. Gwilliam, P. R. Hutchinson, A. W. McAuslane, J. Goodenough, R. R. Richards, C. R. Fleming-Williams, M. F. A. Paine, F. O. Gibbon, C. J. W. Hosken, A. W. Thompson, H. J. Barwick, D. L. Hollis, W. T. Curtis, C. H. Butcher, H. B. Golding, J. J. Lovesay; J. A. McOnie to be Sec. Lt. (on prob.), Sept. 18th.

TERRITORIAL FORCE.—R.E.—NORTHUMBRIAN DIVL. ENGRS.—Sec. Lt. (temp. Capt.) H. C. Stroud is sec'd. for duty with the R.F.C., Sept. 22nd.

INFANTRY.—NORTHUMB'D FUS.—Sec. Lt. H. F. Groves is sec'd. for duty with the R.F.C., Sept. 2nd.

YORKS R.—Sec. Lt. (temp. Lt.) H. G. Amis is sec'd. for duty with the R.F.C., Oct. 2nd.

ARGY. AND SUTH'D HIGHRS.—Sec. Lts. sec'd. for duty with the R.F.C.:—A. Gray, T. Thomson, Sept. 30th.

LONDON REGT.—Sec. Lt. (temp. Lt.) G. L. Colomb is sec'd. for duty with the R.F.C., Sept. 29th.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Oct. 11th.—Sub-Lts. (temp.).—A. S. Cheshire, promoted to Lt. (temp.), seny. May 15th; and H. French (R.N.V.R.), promoted to Lt. (temp.), seny. Oct. 5th.

Chief Petty Officers (1st Cl.).—J. W. Jean, W. Cole, V. H. Lurie, F. Polley, and M. F. Morris, all promoted to Warrant Officer (2nd grade), seny. Oct. 1st.

The undermentioned have been promoted to Warrant Officers (2nd grade) for temp. service, seny. Oct. 1st:—Chief Petty Officers (2nd Cl.) E. A. Blundell, J. S. Middleton, and F. W. Todd; Chief Petty Officers (3rd Cl.) B. H. England, W. J. Standish, and W. J. Harris; and Petty Officer J. C. Nerney.

Proby. Flt. Sub-Lt. (temp.) A. A. Bryce-Buchanan and Air Mech. (2nd grade) N. McCrerrick have been granted temp. commissions as Sub-Lt. (R.N.V.R.), seny. respectively Oct. 9th and 15th.

Messrs. C. C. Purdy and C. C. Goodhue, both entered as Proby. Flt. Sub-Lts. (temp.), seny. respectively Aug. 23rd and Sept. 13th.

Mr. A. E. Kitsell entered as a Warrant Officer (2nd grade), temp., seny. Oct. 9th.

Oct. 12th.—Mr. C. E. Fox, entered as Proby. Flt. Officer (temp.), seny. Oct. 15th, and apptd. to "President" for R.N.A.S.

Lieut.-Commr. (R.N.)—K. G. Brooks, apptd. Act. Commr., seny. Oct. 9th.

Mr. L. E. M. Gillman, entered as Prob. Flt. Officer (temp.), seny. Oct. 15th.

Messrs. F. L. Morrison and H. D. Grant, both granted temp. commissions as Sub-Lt. (R.N.V.R.), seny. respectively Oct. 10th and 11th.

Act. Carp.—C. V. Lacey, graded as a Warrant Officer (2nd Class), seny. May 19th.

Oct. 13th.—The following have been entered as Probationary Flight Officers (temp.), seniority Act. 15th: H. S. Driver, E. D. B. Russell, E. S. Ades, J. F. V. Sugars, F. T. P. Williams, G. B. Shaw, L. R. Knowles, A. W. Wood, I. E. Smithies, W. B. E. Powell, M. J. R. Duff-Fyfe, and C. R. L. Outhwaite.

Oct. 14th.—Messrs. R. M. Smylie and J. J. W. Nicholson, granted temp. comms. at Lt. and Sub-Lt. (R.N.V.R.) respectively, seny. Oct. 13th, and both apptd. to "President II," addl., for R.N.A.S.

Oct. 16th.—Chief Petty Officer.—W. Liniker, promoted to Warrant Officer, 2nd grade (temp.), seny. Oct. 1st.

Mr. H. L. Crowe entered as Proby. Flt. Sub-Lt. (temp.), seny. Sept. 28th.

* * *

OFFICIAL COMMUNIQUÉ.

Oct. 14th.—A successful raid was carried out on Oberndorf on the afternoon of Oct. 12th by a large number of French and English naval aeroplanes.

Three English machines failed to return.

* * *

THE CASUALTY LIST.

Reported Oct. 14th, 1916.

SLIGHTLY INJURED.—Wright, Prob. Flt. Sub-Lt. John S., R.N.

PRISONER.—Millard, Flt. Sub-Lt. Brian A., R.N.

TESTED and ADOPTED by the ADMIRALTY

PATENT

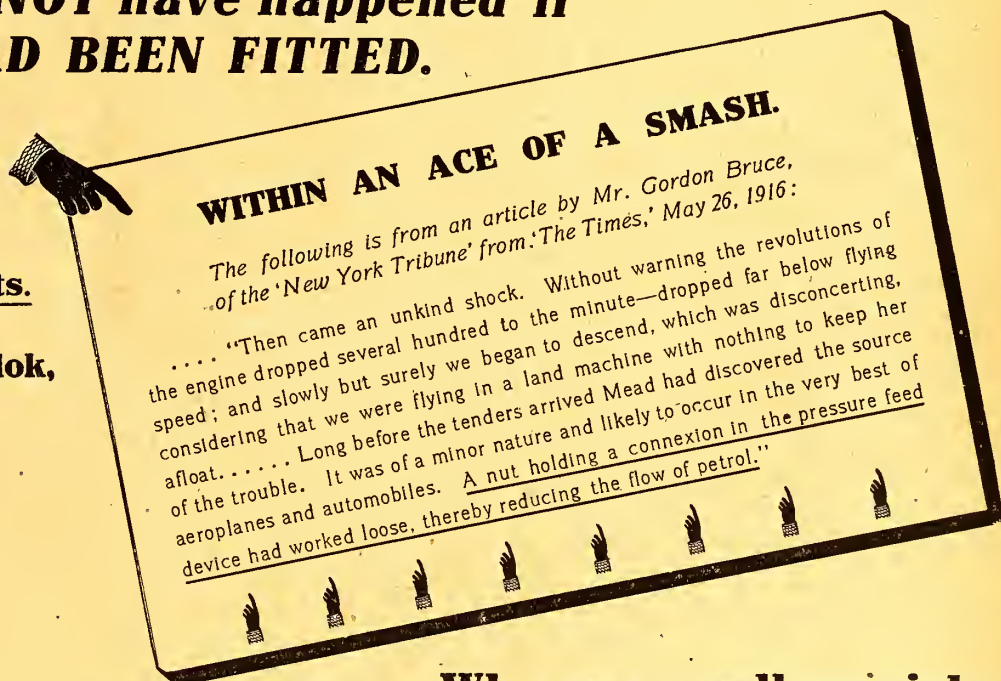
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PATENT

Reliable Safety Lock Nut

***This could NOT have happened if
VISLOK HAD BEEN FITTED.***

**All other
Government Depts.
having tested
and adopted Vislok,
we invite
Aero Dept.
to make an
Official Test.**

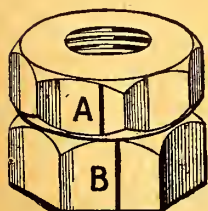


**Why run needless risks
when Security can be Guaranteed?**

Mr. W. J. SMITH, C.E., Engineer and Surveyor, Market Harborough, writes on May 8, 1916:

"Some time ago I called at your works to say that I found the greatest difficulty in keeping the Ordinary nuts securely fastened upon our 10-ton STEAM ROAD ROLLER and SCARIFIER.

"Your men at my request fitted the VISLOK, and after NINE MONTHS almost daily rolling and scarifying, in some cases pulling up tar macadam surfaces, there has not been found one loose Vislok, neither has my engineman, during that period had to tighten a single Vislok, and to-day they appear as fast as the first day they were fixed"



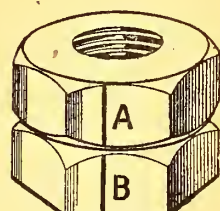
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UNLOCKED

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

A verdict of accidental death was returned on Oct. 14th at the inquest at the Royal Naval Hospital, Chatham, on William Herbert Hodgson, 24, of Bradford, a petty officer mechanic, R.N.A.S., drowned in the River Medway through an accident to a seaplane.

The evidence showed that when the machine rose from the water at the Isle of Grain it started flying at a very steep angle, until it reached a height of nearly 100 ft. It then side-slipped perpendicularly and nose-dived. As it reached the water the machine turned right over. The pilot, Flt. Sub-Lt. Mostyn Lewis, was thrown out, and fell clear of the seaplane, but the observer Hodgson fell with the machine. The pilot swam searching for him. Boats put off from the shore and rescued Sub-Lt. Lewis, and eventually, when the machine was raised from the water, Hodgson was found across his seat entangled in the wreckage. The accident occurred about seven a.m. The machine was flying at less than thirty miles an hour, so that it is not surprising that it side-slipped.

Staff-Surgeon Hawkins stated that death was due to drowning, and expressed the opinion that Hodgson lost consciousness in falling. Flt. Sub-Lt. Lewis was unable to attend the inquiry as he was suffering from shock.

* * *

Mr. Frank Danvers-Yates, first cousin of the Duke of Leeds, was arrested on Oct. 14th as an absentee from military service. Mr. Danvers-Yates is over military age, and is in possession of an official discharge from military service.

When war broke out he was in Russia. He paid his own fare back to this country, joined the R.N.A.S., and became one of the pioneers of aerial photography. Although over age, he put patriotism above all else, and declared that he was only thirty-eight.

It is reported that an anonymous letter was sent to the military authorities last week. On the strength of this, without any official investigation, he was subjected to the indignity of arrest, and taken to Marylebone. The magistrate remanded him for a week on £20 bail, although Mr. Danvers-Yates declared that in spite of being over military age he would be only too glad to serve the country again.

PERSONAL NOTICES.

BIRTHS.

MAUDE.—On Oct. 11th, 1916, at 31, Cavendish Square, to the wife of Flt. Comdr. C. E. Maude—a son.

* * *

SMYTH-OSBOURNE.—On Oct. 11th, at 39, Pont Street, the wife of Commander P. Smyth-Osbourne, Royal Navy, of a daughter.

* * *

MARRIAGE.

ROSS—KINNARD.—A marriage has been arranged, and will take place in December, between Lt. Robert Peel Ross, R.N., Sqdrn.-Comdr., R.N.A.S., only son of the Rev. R. Peel Ross and Mrs. Ross, of Druin, Inverness, and grandson of the late Capt. Horatio Ross, of Rossie Castle, Montrose, and Muriel, youngest daughter of Mr. E. H. Kinnard and Mrs. Kinnard, of Cleveland, Westgate-on-Sea, Kent.

MILITARY.

G.H.Q. COMMUNIQUÉS.

Oct. 10th, 9 p.m.—An enemy aeroplane was brought down north of Neuville St. Vaast.

Yesterday our own aircraft were again very active. One of our machines is missing.

Oct. 11th, 10.25 p.m.—Yesterday our aeroplanes destroyed by bombing two enemy battery positions, and damaged many others. They penetrated well behind the enemy front and bombed railway stations, trains, and billets with good effect.

There was much fighting in the air, and in one case two of our machines engaged seven hostile aeroplanes and drove down or dispersed them all. One of these enemy machines was seen to be destroyed and two others severely damaged. Four of our own machines are missing.

Oct. 12th, 10.22 p.m.—Though the weather was unfavourable for aircraft, there has been much bombing activity during the past two days by our aeroplanes against enemy lines of communication, aerodromes, and infantry on the march. One of our machines has not returned.

Oct. 16th, 9.59 p.m.—Much successful work was carried out by our aeroplanes yesterday in conjunction with our artillery. One hostile battery position was completely destroyed, and many others severely damaged.

Bombs were dropped on an enemy railway station and upon transports moving behind the enemy's lines with excellent effect.

* * *

WAR OFFICE COMMUNIQUÉS.

Oct. 13th.—The General Officer Commanding the British Forces in Mesopotamia reports:—

TIGRIS LINE: On the 10th inst., our aeroplanes bombarded a hostile camp at Gussabs Fort (11 miles south-east of the Dujailah Redoubt, near Kut) with good effect.

On the following morning it was observed that the camp had disappeared.

Oct. 16th.—The General Officer Commanding the British Forces in Salonika reports:—A successful bombing attack on Buk bridge (over the Mesta, north-east of Drama) was carried out by the R.N.A.S.

[And very little *buk* about it apparently.—Ed.]

* * *

THE CASUALTY LIST.

Reported Oct. 11th.

MISSING.—Carmichael, Sec. Lt. W. R. C., Highland L.I., attd. R.F.C.

Miller, Sec. Lt. W. D., R.G.A. and R.F.C.

Reported Oct. 12th.

DIED OF WOUNDS.—Pinsent, Sec. Lt. P. R., R.F.C.

WOUNDED.—Anderson, Lt. W. F., Canadian General List, attd. R.F.C.

R.F.C.—Bryce, 2376, Cpl. N. D.; Munk, 3436, Cpl. G.; Nicholls, 1270, 1st Cl. Air Mech. J. C.

PREVIOUSLY REPORTED WOUNDED AND PRISONER, NOW REPORTED DIED OF WOUNDS AS PRISONER IN GERMAN HANDS.—Dennistoun, Lt. J. R., Cavalry, Special Reserve, and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Griffin, Sec. Lt. R. T., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Leggatt, Capt. E. W., Wiltshire R., attd. R.F.C.; Reynell, Sec. Lt. A. W., R.F.C.

Reported Oct. 13th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS OF WAR IN GERMAN HANDS.—Briggs, Sec. Lt. S. P., Northampton Regt. and R.F.C.

Turner, Sec. Lt. K. K., R.F.C.

Reported Oct. 14th.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Brooke-Murray, Capt. K. A., A.S.C., attd. R.F.C.

WOUNDED.—Miller, Lt. C. C., Duke of Wellington's Regt., attd. R.F.C.

Rice-Oxley, Sec. Lt. A., Shropshire L.I., and R.F.C.

Reported Oct. 16th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Browning-Paterson, Lt. N. A., R.F.A. and R.F.C.

Webb, Capt. G. W., Royal Irish Rifles and R.F.C.

WOUNDED.—Fowler, Sec. Lt. D. D., R.F.C.

Cleaver, Sec. Lt. C. T., R.F.C.

Gibbons, Sec. Lt. S. A., R.F.C.

Hartley, Sec. Lt. R. St. J., Devon Regt., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS AS PRISONER IN GERMAN HANDS.—Wilson-Browne, Sec. Lt. R. M., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—O'Byrne, Sec. Lt. A. J., Liverpool Regt., attd. R. F.C.

MISSING.—Fenwick, Sec. Lt. W. C., R.F.C.

DIED.—R.F.C.—Garratt, 34188 2nd Cl. Air Mech. J. W.

WOUNDED.—R.F.C.—Tilyard, 19845 2nd Cl. Air Mech. F.

MISSING.—R.F.C.—Bellerby, 17018 Sgt. H.; Law, 6537 1st Cl. Air Mech. L. O.

Reported Oct. 17th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Turner, Lt. J. C., R.F.C.

Webb, Capt. G. W., Royal Irish Rifles and R.F.C.

DIED.—Mitchell, Sec. Lt. J. S., R.F.C.

MISSING.—Kennard, Sec. Lt. C., R.F.C.

KILLED.—R.F.C.—Winterbottom, 3192 Cpl. A.

WOUNDED.—R.F.C.—Tilyard, 19845 2nd Cl. Air Mech. F.

* * *

Though the official announcement does not specify the act for which Sec. Lt. W. J. Tempest has been given the D.S.O., it is currently reported that he was concerned in destroying the Zeppelin brought down at Potter's Bar on October 1st.

Mr. Tempest, who is 26 years of age, is one of four soldier brothers, three of whom returned from Canada to enlist when the war broke out, sons of Mr. Wilfrid F. Tempest, of Ackworth Grange, near Pontefract, chairman of the Pontefract (West Riding) magistrates. He joined the Yorkshire Light Infantry in November, 1914, and transferred this year to the R.F.C. One of his brothers, Major W. N. Tempest, Yorkshire L.I., was officially reported killed in action on October 7th and his family received news of his death on the same day that the aviator won the D.S.O. All four brothers hunted with the Bedworth Hounds.

It is reported that Mr. Tempest belongs to the same squadron of the R.F.C. as Captains Robinson, V.C., and Brandon, D.S.O., M.C., and Mr. F. Sawrey, D.S.O.—who have been awarded honours for helping to bring down hostile airships on English soil during the last six weeks.

The "Times" states that: "The squadron has received a large number of congratulatory messages from flying men at home and abroad, and from sections of the flying forces of the Allies. Some of the messages have been addressed to the successful aviators individually, but in the main the greetings have been sent to

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their squadron and this form of recognition has been greatly appreciated by the members of the squadron, in all ranks of which the corporate spirit is very strong."

One feels that if the smudgeographic Press must illustrate the "Heroes of the Air" it would be better that this "corporate spirit" should be expressed in a "corporate" or composite photograph, than that the public's bad taste should be gratified with groups or single photographs posed in the singularly unsoldierly attitudes displayed in some recent pictures.—C. G. G.

* * *

It is notified in the "London Gazette" for Oct. 13th that Lt. W. L. Robinson, V.C., Worcestershire Regt., and Sec. Lt. A. de B. Brandon, D.S.O., Special Reserve, have been promoted from the grade of flying officer to that of flight commander, and are given rank as temporary captains while so employed. Their promotion is ante-dated to Sept. 1st, which almost suggests intelligent anticipation on the part of the War Office.

PERSONAL NOTICES.

DEATHS.

ADAMS.—Killed in action, on Oct. 10th, Capt. Ralph Newton Adams, M.C., Royal Fusiliers and R.F.C., only son of Mr. and Mrs. H. N. Adams, 8, Stanley Crescent, W., aged 20. Capt. Adams was educated at St. Andrew's, Eastbourne, and Charterhouse.

In May, 1914, he was gazetted to the 7th Royal Fusiliers and proceeded to the front, attached to the 4th Battalion, in December, 1914.

He was invalided home in February, 1915, and in August, 1915, was gazetted to the R.F.C. He returned to the front in March last, and was awarded the Military Cross and made Flt.-Comdr. in July. He was killed on Oct. 10th. His Sqdrn.-Comdr. writes:—"He was a most efficient and gallant officer and extremely popular with everybody in the squadron."

* * *

CHARLES.—Reported missing on the 30th July, since reported killed on that date, Leslie Stafford Charles, Captain, Worcester Regiment, and R.F.C., the dearly loved second son of Mr. and Mrs. R. Stafford Charles, Broomfield, Stanmore, aged 21.

* * *

MITCHELL.—Sec. Lt. J. F. Mitchell, R.F.C. (died of wounds), was the only son of Col. and Mrs. T. W. H. Mitchell, of Sandgate, Wath-on-Dearne. He was educated at Bramcote, Scarborough, and Rugby, and was intending to take up the profession of a mining engineer. After leaving Rugby in July, 1914, he went for a tour in Australia and Canada, and returned in July, 1915. Then he began to work on munitions, and continued to do so until he joined the R.F.C. in June of this year. He was only 20 years of age.

* * *

MORISON.—Killed in aeroplane accident on Oct. 13th, Sec. Lt. John Sinclair Morison, R.F.C., dearly loved eldest son of Mr. and Mrs. John Morison, 25, Talbot Road, Highgate, aged 19 years and 11 months. R.I.P.

Mr. Morison was a nephew of Sir Maitland Park, editor of the "Cape Times." He was born at Woodford Green, Essex, in November, 1896, and was educated at Christ's College, Finchley, whence he matriculated in 1913.

He enlisted at the outbreak of the war, and in July, 1915, transferred to the Inns of Court O.T.C. In June, 1916, he volunteered for service in the R.F.C. While flying on Oct. 13th his machine nose-dived, and he was killed instantly. His superior officer speaks of him as being extraordinarily keen and courageous, and a most promising pilot.

* * *

SPEER.—Officially reported missing, now known to have been killed in action on the 9th July, 1916, Alfred Henry Templeman Loraine Speer, Lt., R.F.A., attached R.F.C., elder son of Dr. and Mrs. Speer, of The Priory, Great Malvern, and Powyscourt, Balcombe, Sussex, aged 22 years.

Mr. Speer was educated at Malvern College, where he was in the O.T.C., afterwards proceeding to Trinity College, Cambridge. On the outbreak of war he joined the Public Schools Battalion, and then obtained a commission in the R.F.A., in which he later received promotion.

In 1915 he trained for the R.F.C., becoming attached in January of this year. He was on active service from March until July 9th, when he met his death in combat in the air over the German lines. His machine was shot down and he and his observer were killed. His C.O. reported: "He was a gallant soldier, a fine flier, and a most fearless fighter."

MARRIAGES.

EYTON—CARBUTT.—The marriage of Major Sandford Wynne Eyton, R.F.C., and Miss Frances Carbutt will take place on Tuesday, Oct. 24th, at 2.30, at St. John's, Southwick Crescent. No invitations are being issued, but friends will be very welcome at the church.

* * *

FITZGERALD—FREEMAN.—A marriage has been arranged

between Sec. Lt. Eric Y. FitzGerald, Yeomanry, attached R.F.C., son of the late C. D. FitzGerald, Esq., and grandson of the late Dr. FitzGerald, of West Terrace, Folkestone, and Eileen Constance, youngest daughter of the late Rev. Alex. Freeman, rector of Murston, Professor of Astronomy, Cambridge, and of Mrs. Freeman, 30, Westbourne Gardens, Folkestone.

* * *

PRATT—ALLISON.—The marriage arranged between Mr. G. Brian Pratt, R.F.A., attached R.F.C., and Miss Grace Marian Allison will take place on Wednesday, Oct. 18th, at the Church of St. Jude's, South Kensington, at 2.15 p.m. All friends cordially invited to the church.

* * *

STUART—GRANT-DUFF-AINSLIE.—The marriage between Capt. A. W. Ruthven Stuart, Gordon Highlanders and R.F.C., and Miss Stella Grant-Duff-Ainslie will take place, subject to the bridegroom's leave, at Holy Trinity, Sloane Street, on Nov. 1st, at half-past 2 o'clock. There will be no reception.

BIRTH.

BENNETT.—On the 15th inst., at 46, Riggindale Road, Streatham, S.W., to the wife of Lt. Cedric Bennett, East Surrey Regt., attached R.F.C.—a daughter.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Oct. 10th.—During the night of Oct. 9-10th Adjutant-Pilot Baron and Adjutant Chazard bombarded at Stuttgart the Bosch magneto factory. Dense smoke was seen rising from this factory as the result of the bombardment.

[Stuttgart, the capital of Württemberg, is 100 miles from the nearest point on the French frontier. The return journey, therefore, involved a flight of at least 200 miles.]

Our aeroplanes have shown themselves particularly active in the region of Remiremont (south of Epinal) and the Somme. They fought six air fights, bombed the St. Pierre Vaast Wood, and effected numerous reconnaissances.

Oct. 11th.—Yesterday bombs were dropped by enemy aeroplanes on Gérardmer (south-east of Epinal) and Belfort. The damage was insignificant. Five shells were dropped without any effect in the direction of that town by the enemy's long-range artillery.

In the course of yesterday, besides numerous surveillance, reconnaissance, and range-regulating flights, our aeroplanes fought 15 engagements in the Verdun region, 14 south of the Somme, and 44 north of that river. In the course of the latter engagements four enemy machines were brought down, one by Adjutant Dorme, who thus reached his thirteenth machine brought down. Six other enemy machines were seriously hit and fell into the German lines.

Bivouacs and cantonments in the vicinity of Péronne, the Tergnier aviation sheds, the railway stations of St. Quentin and Guiscard, and the wood of Porquericourt were severely bombarded. A train running between Annois and Ham was attacked with bombs and machine-guns.

During the night of Oct. 10-11th the Lorrach establishment (Grand Duchy of Baden), the Colmar aviation ground, and Mülheim railway station were bombarded.

Oct. 12th.—One of our air squadrons last night bombarded the railway station of Vigneulles (north-east of St. Mihiel), with results that were observable.

ARMY OF THE ORIENT.—Our aeroplanes bombarded Prilep (north of Monastir) and Philippopolis (in Bulgaria, about 140 miles north-east of Salonika).

Oct. 13th.—A Franco-British squadron of 40 aeroplanes bombarded the Mauser Works at Oberndorf on the Neckar.

Four thousand three hundred and forty kilogrammes (over four tons) weight of projectiles were dropped, and their attainment of the objectives aimed at was noted.

Six German aeroplanes were brought down in the course of flights into which they entered to defend their factories.

[The raid on the Mauser factory is one of a series of attacks on important works in Germany recently carried out by Allied aviators. During the last three weeks military establishments, blast furnaces, and factories have been raided as follows:—Sept. 22nd, Ludwigshafen, in the Palatinate, and Mannheim, on the right bank of the Rhine; Sept. 24th, Krupp's works at Essen; Sept. 24-25th, Dillengen and Saarlouis (Rhineland); Oct. 9-10th, Stuttgart (Bosch magneto factory); Oct. 10-11th, Lorrach, Grand Duchy of Baden. Some of these raids have involved flights of hundreds of miles.

Oberndorf is a town of about 4,000 inhabitants, 70 miles from the nearest point on the French frontier. It was here that Dr. Paul von Mauser (who died two months before the outbreak of the present war) was born and produced the famous rifle, "Mauser 71," which was adopted by the German Army in December, 1871. The factory was originally an Augustinian monastery, and doubtless the Allies will be accused of Vandalism in damaging it, if, in



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DATES OF ISSUE.—MONTHLY LIST (completely illustrated, about 28 pages), No. 27 Wed., Nov. 1st. WEEKLY LIST (giving prices and particulars of stock on hand—not illustrated), No. 26B, to-day, Wed., Oct. 18th; No. 26C, Wed., Oct. 25th.

A SPECIAL LIST OF A.G.S. PARTS will be published on Nov. 1st next. This will contain about 32 pages and will include all the most important items. Each part will be illustrated by reproduction of actual photographs and blue print drawings. Complete dimensions and R.A.F. Material Specifications of all marked numbers will be given.

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fact, any bombs reached it. It only strikes one as strange that such raids as these were not made a year or so ago.—Ed.]

Oct. 14th.—Our aeroplanes bombarded Vouziers (north-east of Reims) and Ardeuil (south of Vouziers). Fog and clouds hampered air operations along the whole of the front.

Oct. 15th.—In the course of the recent bombardment of the Mauser works at Oberndorf Adjutant Lufbery, of the American squadron, brought down his fifth enemy machine.

In spite of the clouds 300 metres from the ground and a veritable and continuous barrage of fire between 200 and 300 metres, our aeroplanes co-operated in the most effective manner in the fighting yesterday south of the Somme. They surpassed all that could be expected of them. One of our machines returned riddled with over 200 bullets. North of the Somme two pilots attacked the enemy with machine-guns at short range in his trenches, flying very low.

There was great air and artillery activity in the Somme region.

Oct. 16th.—In the sector of Lassigny a German aeroplane which was hit by our artillery fell in flames in its own lines.

In spite of the bad weather our aeroplanes fought seven engagements, in the course of which one enemy machine was brought down.

* * *

It is officially announced that Lord French visited le Bourget, near Paris, on Oct. 13th, and, in company with General Dubail, Governor of Paris, inspected some of the air defences of the capital. The British Field-Marshal displayed great interest in the defences. One hopes that he learned something to his advantage seeing that Paris has only had about two Zeppelin raids all through the war.

* * *

It is reported that Capitaine Maurice Bernard has been killed in an aeroplane accident at Pau.

* * *

An article written by the "Morning Post" special correspondent with the French Army on Oct. 10th states that during the operations under review "five or six French observation aeroplanes were directing the fire of the batteries. The fighting planes were engaged farther afield, and two German Aviatiks took advantage of their absence to sneak over the French front lines. They "spotted" our party, which was rather large for the advanced trenches, and, mistaking us for people of importance, they began to make themselves objectionable. First they threw down a bomb or two, which all burst clear of the parapet and produced no more effect than the shells which were bursting not far away. Then one of the aviators evidently decided that we were offering him an excellent opportunity for machine-gun practice, and he proceeded to put bullet after bullet into the parapet of the trench on either side of us. It is not easy to shoot from an aeroplane at a mark on the ground, and, considering the instability of his machine, the German made fair practice. At any rate, his bullets came with a vicious hiss and a dull thud as they hit the ground distinctly nearer than was pleasant.

[The practice with the machine-gun must have been remarkably good for the journalists to have been conscious that they were being fired at.—Ed.]

* * *

The "Daily Telegraph's" Paris correspondent reporting the official mention of French aviators taking part in infantry attacks, states that the aviators attached to the infantry belong to a special section. They precede each attacking wave by a few yards and fly extraordinarily low, sometimes not more than a hundred yards or so above the enemy's lines, upon which they drop bombs, thus paving the way for the infantry advance and simultaneously, of course, signalling back information to the infantry as it comes on.

Of course such attack would be impossible but for the fact that the enemy does not dare to explode shells immediately above his own troops.

One believes, however, that the chief function of infantry aeroplanes is to signal the position of the infantry to the artillery which is covering their advance with its barrage fire.

GERMANY.

OFFICIAL COMMUNIQUÉS.

Oct. 11th.—Our aeroplane squadrons successfully bombarded troop transports near Constantza.

Our aviators brought down four aeroplanes behind the enemy lines and four behind our own line.

Oct. 13th.—Our aviators successfully attacked strong enemy squadrons which were on their way to South Germany, and, supported by our anti-aircraft guns, brought down nine aeroplanes. According to reports at hand five persons were killed and twenty-six wounded by the bombs dropped. The material damage caused is slight, and no military damage resulted.

[This appears to refer to the raid on Oberndorf. It will be noticed that all allusion to the Mauser factory is omitted, and the name of the town attacked is not mentioned, although the affair took place in daylight. One London paper says: "The evident intention is to make the public believe that the Allied air squadrons

were driven off before reaching their objective." It may also be that the Germans want to make the Allies uncertain as to whether Oberndorf was ever reached, for even in broad daylight pilots are apt to make mistakes. On the whole, the German suppression of the news is quite as sensible as most of our own official suppressions, and more sensible than many of them.—Ed.]

Oct. 13th.—Yesterday (Thursday), between 3 and 5 in the afternoon, several air squadrons, totalling from 40 to 50 machines, flew over our South German home region. Bombs were showered on Donaueschingen, Alleneshofen, Huefingen, Eschweiler, near Neustadt, Haslach, in the Kinzig valley, and Rottweil. They did no military damage. They damaged private property to a small extent, and slightly wounded some civilians. At Huefingen a bomb fell on a reserve hospital, killing two children in a neighbouring garden. In Huefingen itself and at Oberndorf seven persons were killed and a number wounded, the total casualties being 27. Of the attacking aeroplanes nine were brought down by our aviators and anti-aircraft guns, including one British aeroplane.

The enemy in this fresh attack on peaceful German places had to pay for his results, which were without military importance, by suffering heavy losses himself.

* * *

A German soldier recently made prisoner on the Somme said he was at Essen when the town was bombarded by French aeroplanes. He says a big building and a reservoir were hit, and Krupp's factory suffered severe damage.

* * *

According to the "Daily Telegraph" a letter published in Paris on October 13th, purporting to have been sent from Metz by a neutral route, describes the havoc done in the town by the recent bombardment by French aeroplanes. Almost nothing is left of the imposing Metz railway station, the permanent way is torn up, and the iron pillars of the roof broken and twisted. The new quarter near the station was very much damaged. Houses built of stone were hit by the bombs, and fire also broke out. The monumental post office, which all visitors to Metz will remember, is said to have been destroyed, and with it the Emperor Frederick Boulevard, the Bavarian troops' barracks, and also the colossal statue of the Emperor William I.

[These stories received from neutrals, whose chief desire is to please their auditors, should always be received with suspicion. All the damage detailed above is a trifle too good to be true.—Ed.]

* * *

A telegram from Stuttgart, via Amsterdam, states that on Oct. 9th, at 8.54 p.m. and 9.23 p.m., enemy aviators dropped some bombs on the town, but hit neither persons nor buildings.

The Basle "Zeitung" states that the bombs during the Stuttgart raid partially wrecked the State theatre. A wild stampede occurred in the street.

RUSSIA.

OFFICIAL COMMUNIQUÉS.

Oct. 12th.—An enemy air squadron dropped bombs on Constantza, also poisoned sweets and garlic infected with cholera bacilli.

Oct. 13th.—In the region of Seletin (on the River Suchava), in the Wooded Carpathians, an enemy aeroplane was brought down by our rifle-fire. The machine caught fire as the result of the fall. The aviator and observer, who were alive, were taken prisoners.

Oct. 16th.—On the 14th inst. a German aeroplane was brought down by the fire of our machine-guns in the vicinity of the railway station of Proudly. The aviators were made prisoners.

AUSTRIA.

OFFICIAL COMMUNIQUÉS.

Oct. 11th.—In the evening of the 10th inst. one of our aeroplane squadrons successfully bombarded the military object of Monfalcone and Staranzano.

In the night of the 10-11th inst. a seaplane squadron attacked the harbour establishments, the airsheds, and the batteries of Vloras as well as the enemy ships lying there, with the best results. Big fires in the town, which remained visible for a long time, and the burning of an oil tank were observed. All our machines returned undamaged.

ITALY.

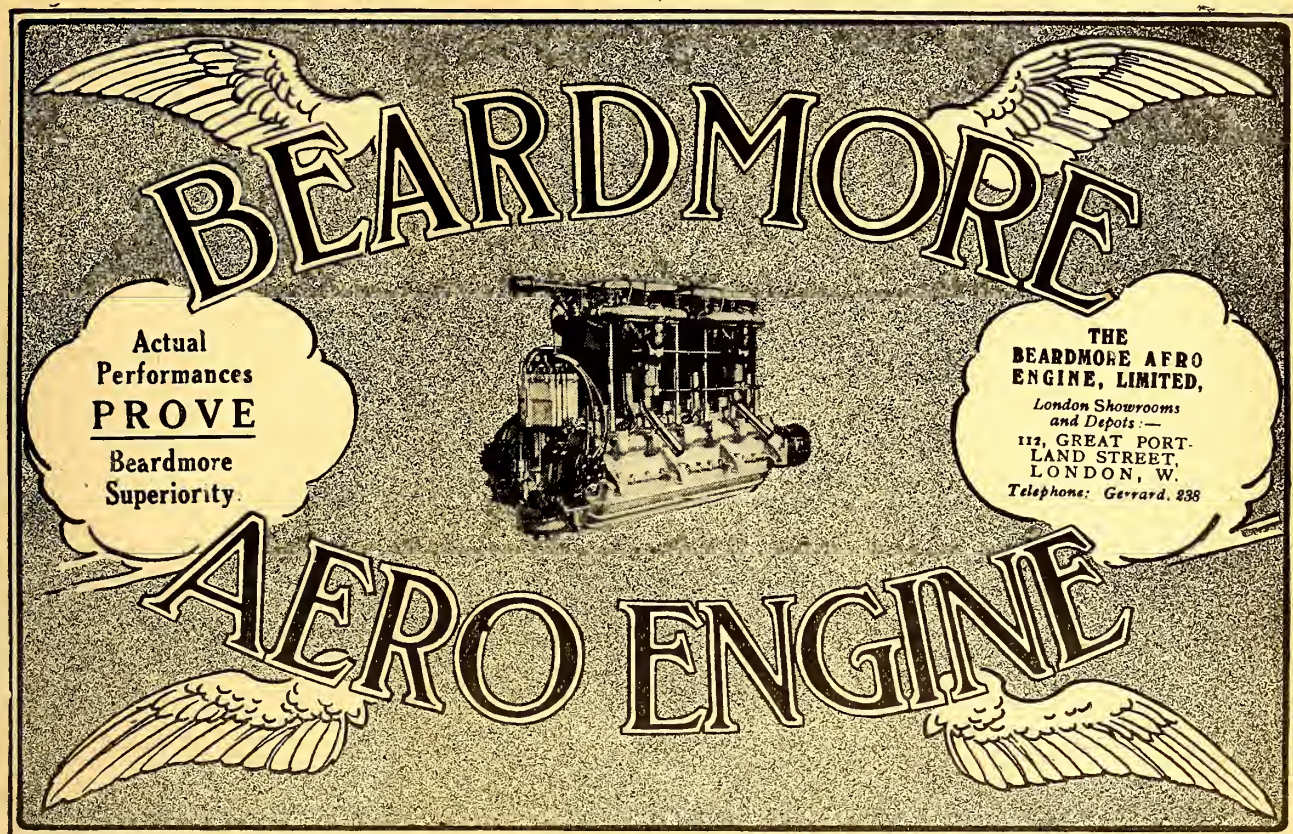
OFFICIAL COMMUNIQUÉS.

Oct. 10th.—Last night hostile aeroplanes made another raid on the Lower Isonzo, dropping a large number of bombs on villages in the Grado Lagoon and elsewhere; three people were killed, a few others wounded, and some damage done.

One of our aeroplane squadrons dropped bombs on the enemy positions on Col Santo, north of Mt. Pasubio. Our aviators drove off numerous aerial attacks and returned safely.

ALBANIA.—On the night of Oct. 8th an enemy aeroplane flew over Avlona, dropping bombs, without, however, causing any damage.

Oct. 12th.—Hostile aircraft dropped bombs yesterday on the Asiago Plateau without doing any damage.



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One of our squadrons again bombarded the enemy's positions on Col Santo (Adige Valley), returning safely to our lines.

Oct. 13th.—Enemy aircraft bombarded the Grado Lagoon and other points on the Lower Isonzo; there were a few casualties, and trifling damage was done.

In an air fight above Gorizia a hostile aeroplane was driven down and fell near San Marco.

Oct. 14th.—Our aeroplanes dropped bombs on enemy hutments in the Sugana Valley, and returned safely.

In the evening enemy aircraft made the usual raid on the Lower Isonzo without doing any damage.

* * *

On the occasion of the formal visit of the Head of the Government, President of the Council, His Excellency the Hon. Boselli, to the commercial capital of Italy, Milan, on the 9th inst., one of his first acts was to visit the great aerodrome of Taliedo, where he was received by General Marini, Director-General of the Aeronautical Department.

In a somewhat hurried visit the Premier saw two squadron exhibition manoeuvres, the first a turn-out-and-get-off-in-haste affair, the second a fancy show of fine evolving carried out by two big Capronis and two small Nieuports.

He then met the trade magnates and the magnets (and the rest) in the motor exhibit "pavilion." Young D'Annunzio, the pilot, and son of the poet, was presented, and the whole city was much moved—from the Syndic downwards it is thought.—T. S. H.

ROUMANIA.

OFFICIAL COMMUNIQUÉ.

Oct. 11th.—During aerial attacks by enemy aviators bombs were dropped on Constantza and on the towns on the banks of the Danube.

It is reported that at 11.30 a.m. on Oct. 8th a number of hostile aeroplanes bombarded Bukarest. They were vigorously bombarded by anti-aircraft guns.

* * *

It is reported that Bukarest was raided by enemy aeroplanes on Oct. 8th, which dropped a number of bombs. The enemy aircraft were subjected to severe shrapnel fire, which caused them to retreat. The people were warned of their coming, and consequently the loss of life was slight.

TURKEY.

OFFICIAL COMMUNIQUÉ.

Oct. 12th.—Euphrates Front.—An enemy aeroplane dropped bombs on Shatra-el-Muntefik (north of Nasiriyeh). No damage was done.

BULGARIA.

OFFICIAL COMMUNIQUÉS.

Oct. 13th.—On the Black Sea coast a seaplane squadron attacked the port of Constantza on Tuesday last, causing great fires in the harbour and in the oil tanks.

Oct. 15th.—Near the village of Eridje we shot down in an air fight an enemy aeroplane. The pilot was taken prisoner.

GREECE.

It is reported from Paris that recently a naval observer in a sausage balloon, operating in Macedonia, was attacked by two Fokkers, which fired a stream of bullets, piercing the sausage at several points and destroying the telephone.

He had on board a small machine gun and a parachute, and after having sent the contents of two belts of ammunition at his enemies the gun jammed. He then threw himself overboard with his parachute, and fell for about 600 feet. At last, however, the parachute opened, and the observer landed safely. After which the balloon was repaired and he went up again.

HOLLAND.

It is reported that a German aeroplane landed on Dutch territory on Oct. 12th. The occupants have been interned. Another paper says that a German aeroplane has fallen in the fields in the neighbourhood of Wayre and been smashed to atoms.

SWITZERLAND.

It is reported that a German aeroplane, returning from the direction of Belfort, about midnight on October 12th, apparently lost its way and flew over Swiss territory for a considerable distance. At 1.20 it landed at Amriswil, near Lake Constance.

On learning that he was on Swiss territory the German pilot at once went up again and flew off in the direction of Lake Constance.

* * *

It is reported that on the afternoon of Oct. 13th a German aviator, after having thrown bombs on Belfort, was forced to descend, owing to lack of petrol, near Soleure, Switzerland. He has been interned.

NORWAY.

It is reported from Christiania by the "Morning Post" correspondent that a Norwegian engineer named Kulbech intends to fly the Atlantic. His machine, of 300 h.p., is to weigh 18 cwt. net, and it will have a speed of over 100 miles an hour, "thus

making it possible to cross from Falmouth to St. John, Newfoundland, in 20 hours."

"Before leaving Falmouth he will arrange with certain vessels to transmit to him by wireless while he is on his journey across the Atlantic information as to atmospheric conditions. He will carry a boat, which, he says, if forced to descend he will be able to navigate even in a high sea. He will be accompanied, he adds, by a Danish-American engineer named Johnson, who is employed at present in Wright's aeroplane works in Ohio."

U.S.A.

The United States Navy Appropriation Bill which was signed by President Wilson on August 29th authorises the three-year building programme, which includes four scout cruisers, to be known as numbers 4 to 7 inclusive, which will be the largest and fastest vessels of this class ever laid down for any navy.

Their general characteristics are: displacement, 7,100 tons; speed, 35 knots; length, 550 feet; beam, 55 feet; armament, eight 6-inch guns; four torpedo tubes; and two 3-inch anti-aircraft guns; complement, 330. Their high-powered machinery installation will be protected by light but efficient vertical and horizontal armour.

The chief point of interest, however, will be the complete and proper equipment for carrying, launching and operating four large-sized seaplanes. Presumably these vessels will be the first real warships to be specially designed to carry and operate aircraft.

* * *

One hopes that Lt. John Towers, whose departure from England is so much regretted by the many friends he made while in this country, will be allowed to have a considerable say in the arranging of these seaplanes. Lt. Towers probably knows more about Naval aviation than any Naval officer in any country who has not actually lived on and flown from and to a seaplane-carrier on active service, so it is to be hoped that the U.S. Naval Authorities will hearken unto the man who knows instead of allowing themselves to be misled by the vapourings of theorists—pure or impure—as has happened in at least one country which one could mention.

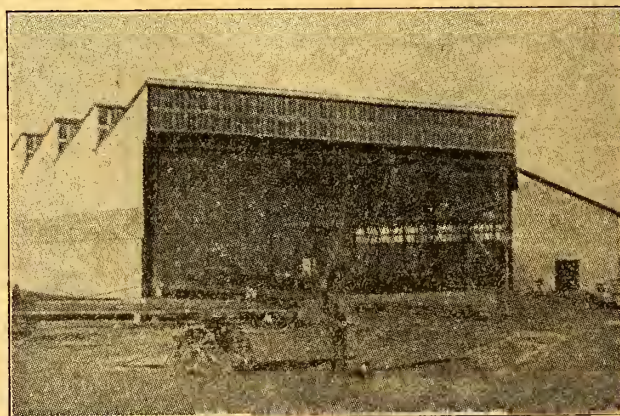
CANADA.

The Dominion Government is arranging for the establishment of an aviation school and aeroplane factory in Canada. This action is being taken with the approval and co-operation of the Imperial authorities, who will send a staff of competent men to take charge of the school. The aeroplane factory will be established under the direction of the Imperial Munitions Board, which has assured orders from the Imperial Government while the war continues.

A number of Canadians has already been trained in Canada and the United States by the Curtiss Co. and the Thomas Bros., though it is occasionally difficult to distinguish between these subjects of an effete monarchy and the free-born citizens of the States. Presumably a real Government School, under a real Munitions Board, will manage to bring the cost per pupil up to the necessary Government standard, even if it does not improve the quality of pilot evolved. The Canadians so far received have been rather good, on the average.

AUSTRALIA.

The official opening of the Aviation School at Richmond, New South Wales, was performed on Aug. 28th by the Governor, Sir Gerald Strickland. About 4,000 people were present at the ceremony, which was rather picturesque, as many of the spectators had trekked in 30 or 40 miles to see the show, and as neither they nor their horses had ever seen an aeroplane before there was something in the nature of a stampede when the flying started, but nothing really serious happened. The usual optimistic speeches were made.



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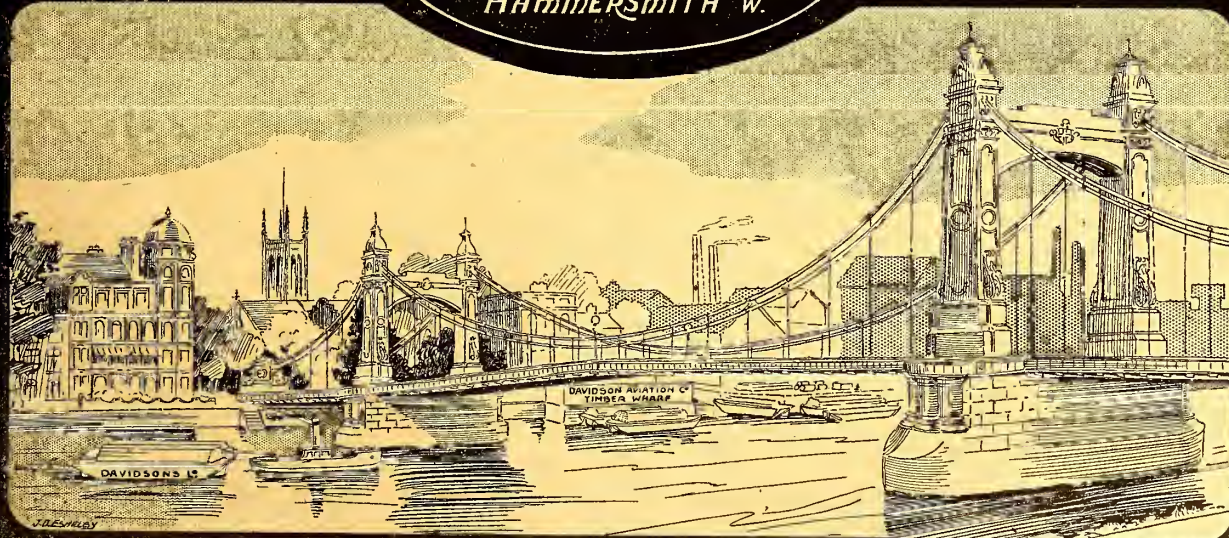
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DESIGNERS & MANUFACTURERS OF AIRCRAFT

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

Some of you may remember a certain sad little story of the blood who was killed in a motor accident, gathered up his ego, and then unconsciously went—somewhere; only to find most of his best friends, and to have such a good time on the first day that he almost believed he was in a kind of earth-like paradise. Until he discovered the non-existence of a certain little essential fitment. "Truly," said he, "this is hell."

So you see what a difference a little thing, such as that suggested valve-cage, can make. Having got it, in such a design as the Wisconsin—or any other for that matter—there will be no need to shift a single bolt on any connection, manifold or mass-fitment. Merely the valve-gear.

All further difficulties and delays are overcome at once, if you can knock out the rocker-pin above the defective valve, or better still, slide the rocker along its pin, clear of cam and valve tail.

ANOTHER LITTLE GADGET.

But as it is not clear from any illustration precisely what is or may be done, and as it is also well to avoid loose *minutiae* and readjustments, I recommend this method. Instead of bushing the rocker according to specification, let the pin be bushed and rock. Its wear will be negligible. Cut the bearing-lugs off either side of the rocker. Instead, make a yoke-piece to cross over the top of it, with forks for distance-pieces surrounding the pin. You can then secure yoke, rocker, and pin solid with a single screw, or even a long split-pin will suffice.

Then the simple removal of this pin will enable the yoke and its forks to be lifted clear of rocker and pivot-pin, and the rocker can be slid along the latter, in or out of motion, in an instant.

Thus the need of disturbing any of the valve-gear mass would disappear. It would be a pity to alter it at all. For making it rockable in the Maudslay fashion would not only put the whole motor out of action—unnecessary and literally suicidal in the case of a big motor that may be driving a seaplane overland, as often happens—but would also mean jointing the vertical driving-shaft, fitting a detachable sleeve to its tubular sheath, if there be one, and slacking off oil-pipe unions: always a messy, oil-wasting business.

So from every point of view, it is simpler to concentrate on the single spot of valve-detachment. Besides, why alter a good design more than necessary? Only—make no mistake about the absolute necessity to that extent!

CERTAIN PHYSICAL CONDITIONS.

Next as to the carburation and induction design. Now, so long

as you centralise the carburettor, and mount it so that the petrol feed from the float-chamber runs transversely of the motor-axis towards that centre—which has been specially done in this case—you may be sure of a regular supply of mixture fore and aft, in a six-cylinder motor: or even if you had eight in some freak construction. It may not be even; that is to say, as full to the end cylinders as to the middle ones. That depends on the induction manifold. To be even, either you must slightly increase the diameter of the piping from the middle to the ends, or you must provide the sort of flattened hoop called in America a shorehaul—from its resemblance to the endless-cable-tackle used to connect a dinghy at moorings with a jetty—to give full charges on continuous yet sensitive circulation, without the backlash which is death to true flexibility.

On the other hand, you may have admirably symmetrical branching in the manifold, and a perfectly even supply: yet partial starvation unto 25 per cent. therewith, on account of this very branching.

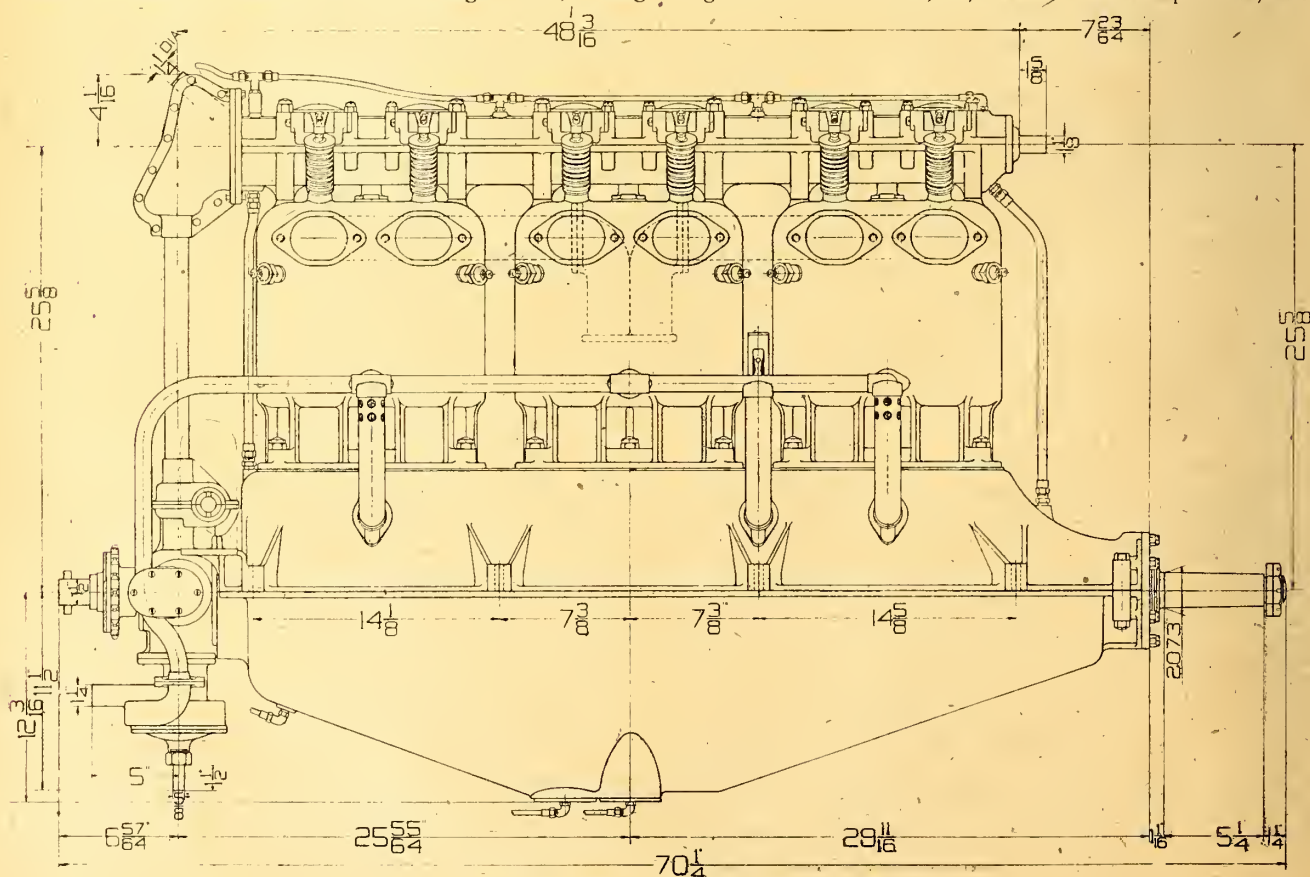
And in any case, all these points chiefly arise because of the dominating effect of Maybach's wretched float-feed master patent of years ago; which only a few such as Levavasseur with the Antoinette, and Kieffer—to a certain extent—have had the courage to ignore. Lastly, Maybach himself has abandoned all his former ground, and provided an excellent, absolutely reliable floatless device, with constant air supply, and control on the petrol supply alone. In which principle at least, I am pleased to say, he has no patent against my own anticipation of seven years ago, and I daresay a dozen others in detail.

THE WISCONSIN WAY.

However, the Wisconsin people have cared for none of these things. In their six-cylinder model they have done within ninety per cent. of as well as possible by feeding from the single float-chamber to two jets, each functioning to its own trunk with a single easy turn to the three forward or after-cylinders, as the case may be.

That other ten per cent. could only have been got in the Italia way of coupling up the cylinder-pairs in their two middle-spaces to tapered induction passages cast in the heads, on the inlet side.

But even this way, theoretically excellent, and as a show-room talking point, makes all three pairs different, and no one pair a spare for any other. Which is uncommercial, and hopeless for aviation supply. So unless they had devised some Maybach, single-omnibus-tube outfit, or, like the Brillé taper tube, with



The Six-Cylinder Wisconsin Motor, 140 H.P.

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a carburettor hung on one end—we may admit that the present design could hardly have been more adequate to working conditions: all the more that—as the illustration shows—each jet is fitted with an externally operated setting needle, to regulate supply. Which is helpful, at least to cope with varying atmospheric conditions, altitudes, and petrol-gravities.

That is, so far as the six-cylinder model is concerned, in which the induction-position, whether right or left of the motor, is hardly even a matter of convenience.

INDUCTION AND EXHAUST POSITION.

With their 12-cylinder model, however, the Wisconsin people appear, in my humble opinion, to have gone hopelessly astray of essential aeromotor conditions with their induction, for these very reasons and others. The cylinder measurements are identical with those of the six: and all other mass design is the same; as it should be. So it would have been just as easy to cast, and arrange valve-gear, for the inlet side to be on the left, looking forwards, instead of on the right.

Then, when it comes to mounting a 12-cylinder model, a plain shore-haul hoop induction, with one or more carburettors hung from any convenient point in the circuit, could have been fitted. Or any of the various constructional applications of this principle which have been described or suggested over and again in these and other disquisitions. With the valves overhead and out of the way, there is no excuse to do anything else. And, then, with the carburettors inward of the mass—and incidentally protected thereby—if the motor had been laid on its side during a steep bank or loop—a perpetual occurrence that motor designers seem to forget all about—both sides of the motor would be in full induction, instead of having one side flooding and the other starving.

AND THE RESULTS THEREOF.

I wonder how many horrible and wholly unnecessary, yet unaccounted-for mid-air conflagrations have really been due to this cause alone. Any old front-line destruction is part of the game and a fair risk; but not to be burned alive over a Blighty aerodrome. We may know little and care less about the niceties of design and motor-merit: but it is up to all of us to be viewers for every essential point of aeromotor safety, no matter how the interests of any trader may suffer. The only sacred thing about shop-keeping is to see that the right goods are delivered.

Still, one may be certain that it is from no intention, but only from inadvertence that the otherwise good Wisconsin design has failed here, placing the induction on the outer side, so that not only must the above defects and dangers, purely relative to induction—accrue, but—since the exhaust can only be disposed of in one way, upwards—the Teutonic-R.A.F. faults of installation must actually be duplicated.

Another little-considered, but still important point, arising out of irregular induction, is that it sets up all sorts of sudden, variable, and wholly uncompensated strains on motive parts. All noticeable

enough, in steam-practice at perhaps 200 r.p.m. And though overlooked, all exist, nevertheless, but multiplied six-fold at 1,200 r.p.m. Or, to be strictly accurate, cubed up to the sixth power.

WHENCE THIS OUTLET.

Disqualification and scrapping of designs is a dreadful thing. But I have nothing so drastic in view. On the contrary, I urge all these points without hesitation, seeing that—since all valves and port passages are respectively of the same size—the necessary change in this case is apparently only a matter of altering cam-positions, and ignition timing. It takes, remember, but the simplest of cam-actions synchronised with the ignition, actually to reverse a four-stroker as gently as a steam-engine, if such a thing were desirable; while in a multi-cylinder valveless two-stroker a 180 degree ignition-rocking alone suffices.

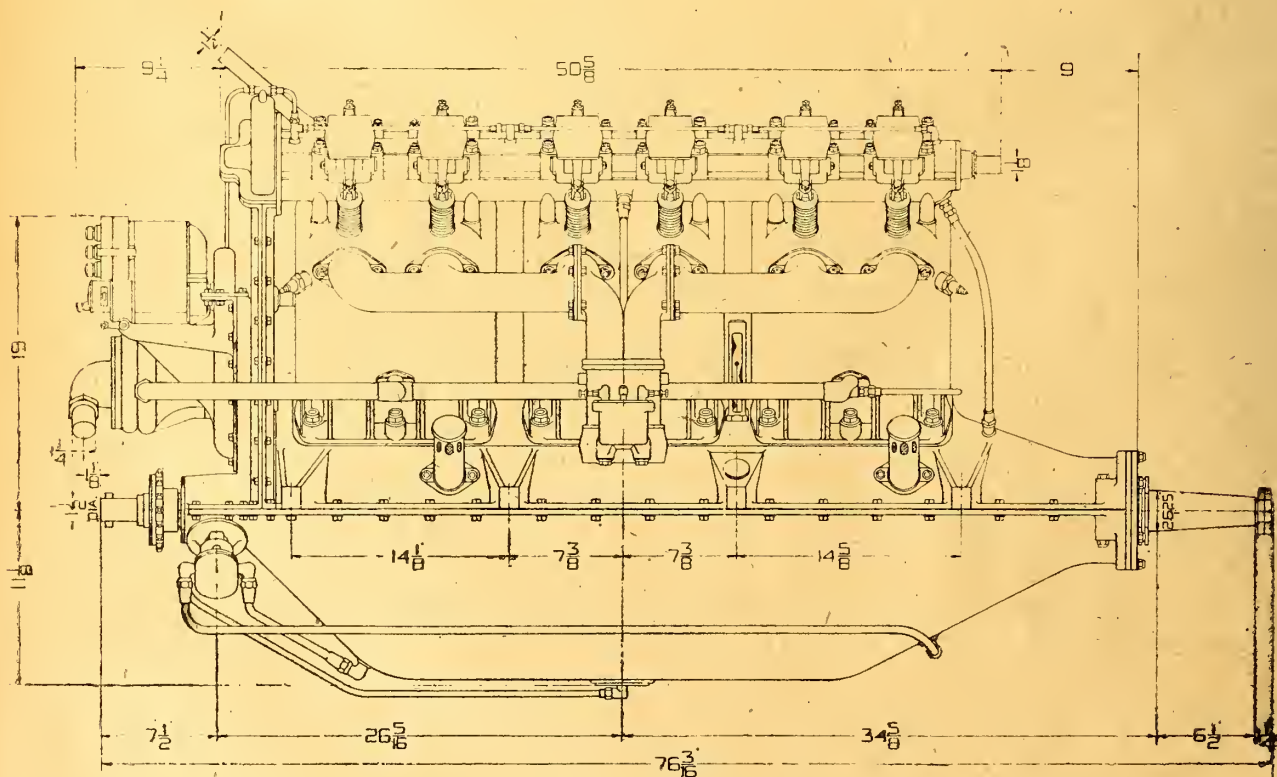
THE WATER CIRCULATION.

The Wisconsin water-circulation detail is quite conventional in lay-out; and, doubtless, good of its kind. Only one might suggest that there is just as much room for the water exit manifold on the exhaust side of the six-cylinder model, where it would be more effective than on the inlet side, where it is. Which variation, however, has been judiciously made in the 12-cylinder Y-type. But here, again, in an aeromotor the two best positions for the pump—from practically every point of view, including the poor mechanic's—are as high up, or as low as may be. Incidentally, except under violent constraint, its drive should not be combined direct with that of the magnetos, though the same gearing—the not uncommon arrangement—may well drive both. Now, in the six-cylinder Wisconsin model, the latter position has been chosen, the pump being horizontal, of the centrifugal-type; fitted with good-sized stuffing boxes, and readily detachable: altogether a wholly adequate affair. Furthermore, its operation could hardly be more remote from the magneto-gearing; as the drive comes direct from a short vertical spindle from below the crank-shaft: only the scavenging oil-pumps being driven off the same group of bevel-gearing.

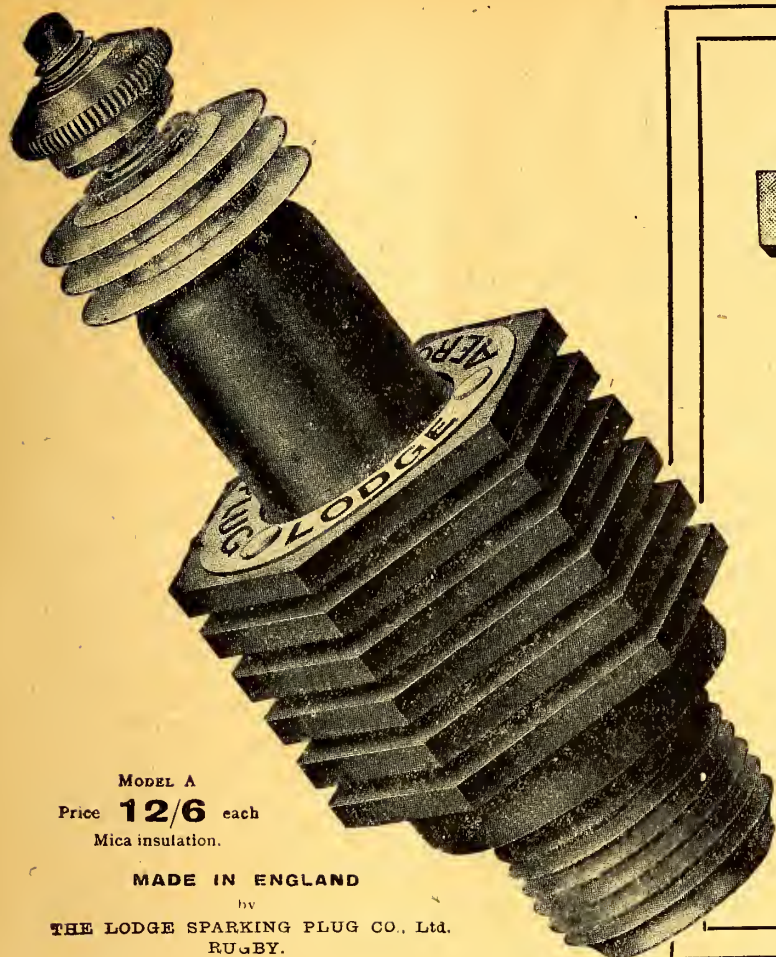
In the 12-cylinder model, however, both physical as well as mechanical considerations—such as the dual valve gear-shafting—make this arrangement and position inappropriate. So a double centrifugal pump is fitted—one-half of which feeds the right-hand cylinder-battery, and the other the left one—and is driven from one of a train of spur-gearing, secondary to, and midway between, the trains of spur-gearing that supersede diagonal shafting to drive the two cam-shafts. One train of spur-gears also drives the magnetos direct; these latter being placed on a bracket, behind the left-hand cylinder battery.

All this leaves the end of the crank-shaft free for a very essential fitting in the case of so large a motor; that is, the sprocket that is actually fitted, or any other starting-gear that might be.

(To be continued.)



The 12-Cylinder Wisconsin Motor 280-h.p.



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ON ACCELERATING AIRCRAFT OUTPUT.

In the early days of aviation aeroplane constructors had to select one of two courses in manufacturing their machines. They were either obliged to make practically every detail themselves, or else to supplement their own products with such ironmongery and other hardware as had been manufactured for entirely different purposes.

If they adopted the first course it meant the expensive installation of special machinery, or the still more expensive process of manufacturing metal parts by hand, and in those days money being unobtainable for aircraft ventures, machinery was likewise unobtainable, with the natural result that the early aeroplanes were built entirely by hand.

In the long run this method was preferable to the doubtful practice of buying manufactured metal fittings intended for use on motor cars, motor cycles and on agricultural machines in the hopes that they would perform their functions somehow.

Both plans were most unsatisfactory, especially when the outbreak of war demanded that production for the Admiralty and War Office should be rapid yet accurate. The result was that many manufacturers who had installed a certain amount of machinery found themselves waiting for the completion of tools, etc., for the manufacture of comparatively insignificant parts of aeroplanes which were otherwise complete.

Another difficulty arose with firms who undertook contracts to R.A.F. specifications. Many of the details in Government machines are of very intricate workmanship—quite unnecessarily so in most cases—and have to be made to extremely fine limits, and really demand special study for their adequate production.

It soon became apparent that there was room for a firm to centralise the manufacture of component parts of aeroplanes, and Mr. George H. Mansfield, formerly of the Grahame-White Co., laid himself out to fill the want. He founded the firm now known as the Aircraft Supplies Co., Ltd., and set to work to make a special study of the supply of standard aeroplane parts. He first of all placed himself in a position to purchase for the Trade all manner of aeroplane details made by the best people in the country, and was soon able to supply with the least possible delay both large and small quantities of almost anything that was demanded. Large stocks of many articles were available at his own warehouse for immediate delivery, and special patterns were quickly manufactured.

The idea soon became extremely popular with the Aircraft Industry generally, because it became evident that despite the legitimate factor's profit made by the Aircraft Supplies Co., Ltd., many of the articles handled by them could be bought more cheaply than the aeroplane manufacturers could make them themselves. This phenomenon is, of course, explained by the recognised rule that it is cheaper to make a thousand articles at a time than to make ten.

The success of this enterprise was so encouraging that Mr. Mansfield has felt warranted in launching out into a wider field of operations, and is hard at work organising a factory of his own where standard parts, as well as components to special specifications, can be turned out rapidly and economically. Convenient premises have been taken at the back of the firm's offices in John Street, W.C., which will allow of considerable expansion as the work continues. At the present time a very useful set of shops is in operation fitted with up-to-date machinery, and all the equipment necessary for the manufacture of repetition parts.

Among the machine tools already at work are a No. 4 Herbert Capstan Lathe turning out Duralumin Pulleys; a number of $\frac{3}{4}$ in. Capstan Lathes making special Eyebolts (AGS 122) and Shackle Pins; eight large and small Milling machines, machining wing tip skid sockets (No. 5790, Part 3 and 4), Shackles, Elevator levers (Drawing 9807, Part 1) and other drop forgings; a Chicago Automatic, turning out 100-ton pins (AGS 137), and No. 2 Foster Capstans, making Duralumin Washers (AGS 157) and special Hinge bolts.

The Tool room is well equipped and able to cope with the making of any tools required for the various machines.

The works naturally contain an adequate number of single and double Spindle Drilling machines, screw cutting lathes and similar auxiliary plant.

The power is derived from three 120-h.p. Electric Motors.

A further portion of the shops is ready for additional machinery, which is expected to be installed within the next few weeks, and these include several automatics, screw cutting and capstan lathes, including an additional No. 4 Herbert.

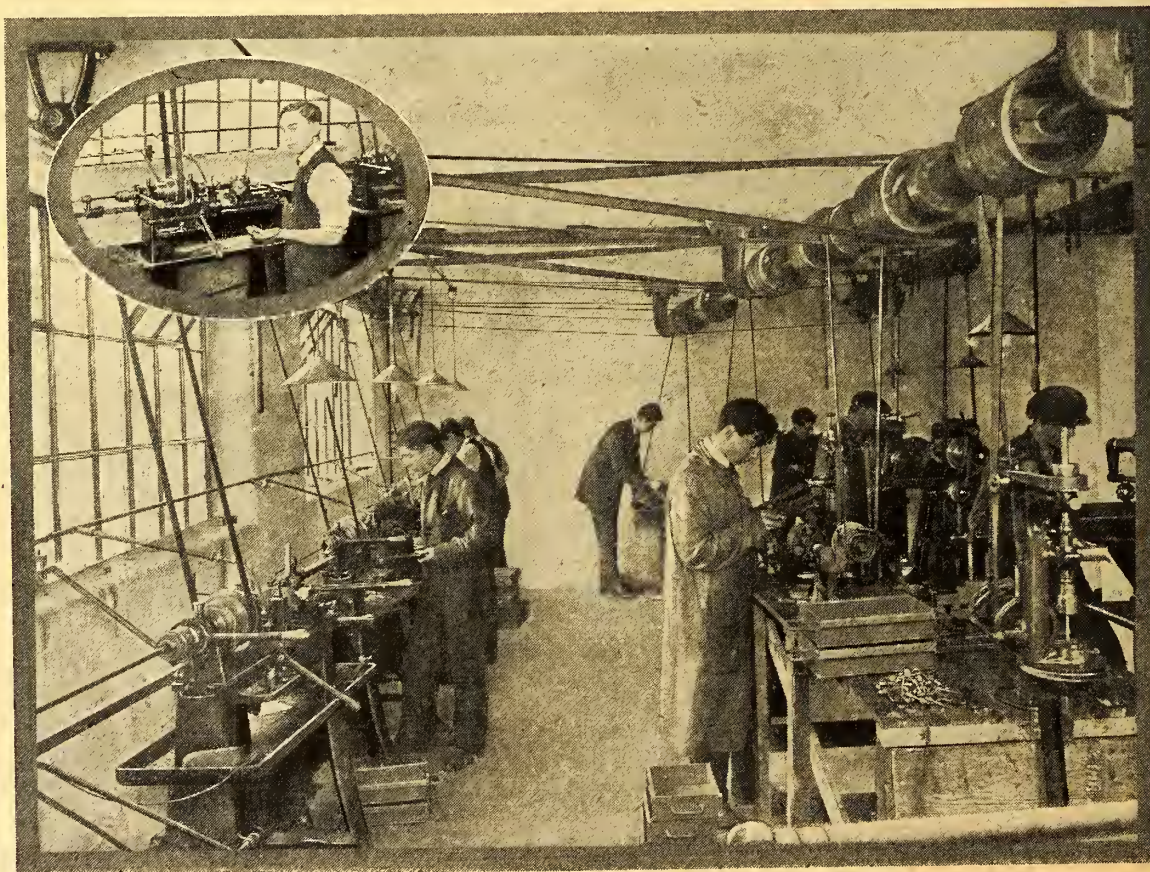
A new shop is being provided for the installation of a plant for suaging rods, and drawing stream-line wires, and for the accommodation of a number of power presses.

The Aircraft Supplies Co., Ltd., have kept the Aviation Industry thoroughly well posted with information as to the supply of standard aircraft parts available at any time by the circulation of their fortnightly illustrated stock lists.

In the future information of this character will be kept even more up-to-date by the circulation of a weekly stock sheet and a monthly stock booklet. The first of these weekly stock sheets is already out and takes the form of a large card which can be transmitted by book post, and into each sheet is compressed a wonderful amount of information.

It is well known that the method employed by the Government in issuing specifications for the different standard parts of Government machines is to issue blue prints containing drawings and detailed dimensions. These sheets are catalogued under an elaborate system of numbers, and it is the intention of the Aircraft Supplies Company to issue a book for the private use of the Aircraft Industry, containing reproductions of all the more im-

A Corner of
the Aircraft
Supplies
Co.'s Works
at John
Street. The
machines
shown are
capstan
lathes
engaged in
turning out
various
small parts
such as
eyebolts and
shackle
pins.

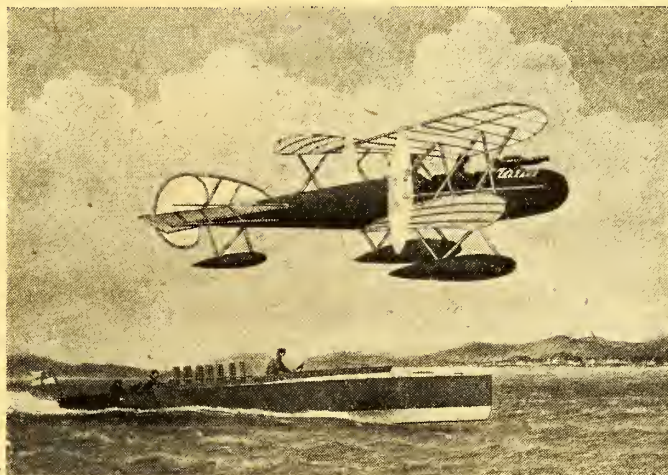


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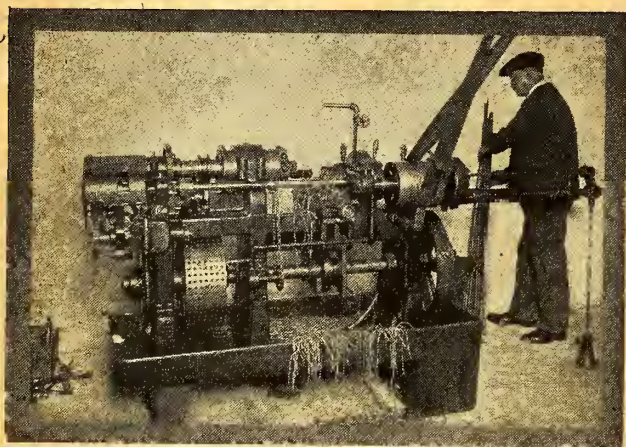
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The Aircraft Supplies Company's Works. Chicago Automatic turning out 100-ton pins (AGS 137).

portant AGS blue print specifications (AGS meaning Aircraft General Supplies, the official term applied to standard parts). The official drawings and details will be supplemented by photographs of the various parts. This booklet, which will appear this month, should assist constructors as a work of reference.



A corner of the Stores in the Aircraft Supplies Company's Works showing stock bins.

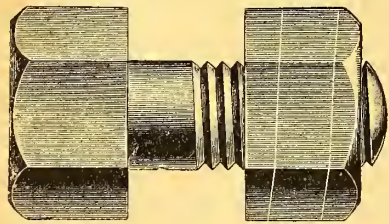
The success of the Aircraft Supplies Company is largely due to the care with which Mr. Mansfield has selected his assistants in his enterprise. Mr. Bernard Isaac is an active co-director, the Works' Manager, Mr. Smith, is a highly qualified engineer, and the chief buyer, Mr. Herring Smith, is also a man of engineering experience.

Both the Works' and Office staff are of adequate size to secure prompt execution of orders.—W. L. W.

THE "HELICOID" LOCK-NUT.

Bayliss, Jones & Bayliss, Ltd., of Wolverhampton, whose speciality is the manufacture of bolts and nuts of all kinds, have for some time had upon the market a very useful lock-nut called the "Helicoid."

This nut is of the ordinary hexagonal section, and in general appearance is not unlike the common or garden nut, but closer examination reveals the fact that a helical split travels round the



nut about $2\frac{1}{2}$ times in a similar way to that in which a key-ring is split, only in the case of the "Helicoid" nut the split travels down the side of the nut from top to bottom. This split naturally endows the nut with a certain amount of elasticity, and allows the

internal threads to deviate slightly from their true path, with the result that the threads of the nut butt solidly against the threads on the bolt on to which the nut is screwed, and give the effect of a split spring washer underneath the nut.

As a matter of fact it is claimed that the "Helicoid" nut grips a great deal more tightly than the ordinary nut with a split spring washer, or an ordinary nut with a lock-nut on top.

The advantage claimed for the "Helicoid" over certain other locking nuts is that there is only the ordinary operation of screwing on the nut and tightening up with a wrench, without the need of secondary operations either to attach or detach the nut.

SOME FLYING KIT.

Dunhills, Ltd., of Euston Road, N.W., and of various other well-known addresses, especially the Regent Street end of Conduit Street, have for some time past made a speciality of flying kit, and are ceaseless in their efforts to improve garb that already possesses both comfort and elegance. Despite the high quality of all their goods their prices are extremely moderate, and the creature comfort of any aviator can be entrusted to this firm with confidence.

Among the most useful garments vendable for the present and coming season are the following:—

THE "AVION" SLIP-ON.—This is a full-length weather-proof affording complete protection, although well ventilated. The garment is modelled on the lines of the R. F. C. Service tunic, with the outer flap reaching right across the right breast, and it is fastened with a self-adjusting belt at the waist. The coat is made of hard-wearing, heavily proofed



The Avion Slip-on.

twill, and lined with check proofed material, the price being £3 17s. 6d. Detachable fleece lining is also supplied for about 25s. extra.

UNDER-JACKET IN KHAKE TWILL, WITH FUR LINING.—This garment is intended to take the place of an ordinary waistcoat, and to be worn underneath a leather coat. It is sleeved, as will be seen in the illustration, and double-breasted. It is lined with silver musquash, and is priced at £5 15s. 6d. A cheaper variety is marketed lined with soft lambskins at £4 14s. 6d.

DETACHABLE FUR COLLAR.—This is made to fit the standard aviation coat of R.F.C. type with "Prussian" collar. The fur is opossum, and the collar can be turned up or down. It naturally gives very effective additional protection for the neck. The price is from 31s. 6d.

WATERPROOF KNEE COVERS.—These are a real novelty which supplies a long-felt want. The ordinary



The New Under-Jacket.

top-boots afford no protection to the knees, nor does the short leather coat usually worn by aviators. These covers, however, fit well down into the tops of high boots and go sufficiently far up the thighs to keep both wet and cold away. They are made

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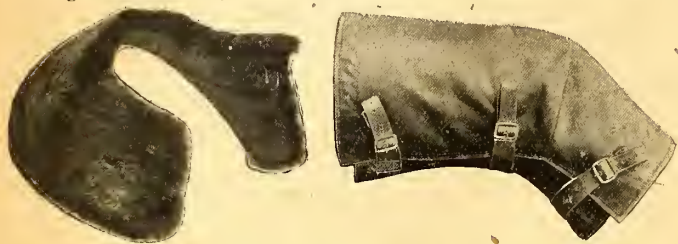
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The New Fur Collar and the Knee-Muff.

otherwise, will do well to write for the aviation catalogue, and self-measurement forms, to their head establishment, at 359, Euston road, N.W. Those who are in town will find an excellent selection of garments of all kinds, and many fascinating accessories at the Conduit Street branch.

SAUNDERS'S OF COWES.

During a brief trip to the South recently the writer had the pleasure of seeing some of the good work which is being done by the firm commonly known as Saunders's of Cowes—but officially designated S. E. Saunders, Limited—the famous boat-builders. It would be contrary to the Defence of the Realm Act to indicate the precise nature of the work now in hand, so it must suffice to say that it is of very striking proportions, and in every way worthy of the firm which produced "Maple Leaf" and other historic hydroplanes.

The firm's method of turning out aeroplanes fully upholds its reputation for high-class workmanship and finish, and naturally the men, who have been trained to boat building, take kindly to the production of aircraft parts.

The old boat-building shops have been cleverly adapted to the needs of aeroplanes, and new shops have been built, so that the firm's output is such as would have seemed enormous, or even incredible, before the war, and even to-day it is a very respectable turn-over, which entitles the firm to be reckoned in the front ranks of the Aircraft Industry on quantity as well as quality.

Some time ago one of the new shops was burnt out, through some accident, and a vast amount of valuable material and finished parts were destroyed. Very wisely Mr. Saunders called in Mr. Humphreys of the Fairby Construction Co., Ltd., to build an entirely new shop on the same ground, and this was just taking shape when the writer was there. Where the Fairby Co. get their men and how they induce them to work at the pace they do is one of life's little mysteries, of which, however, Mr. Humphreys evidently possesses the solution. One could scarcely believe that the shop had grown to the existing size in the few days during which the Fairby men had been at work, but one could see from the speed and energy with which the men went about their jobs that very rapid progress was being made. The Fairby Co. seem to have discovered how to make the British Workman hustle without scamping his work, for the work was being thoroughly well done.

Doubtless by now the new shop is finished, and the Saunders' output correspondingly increased. The writer expresses his thanks to Mr. Saunders, junior, for kindly showing him round at a busy time of the day, and congratulates the firm on the high quality of the work they are turning out.

A PISTOL ATTACHMENT.

Mr. Wm Evans, of 63, Pall Mall, the well-known gun-maker, has recently improved a device which he has had on the market for some time to catch empty cartridge shells as they fly out of the breech of automatic pistols. In the previous edition of the patent reliance was placed upon the sideways travel of the cartridge-case to throw it into the cage, but as it had been found on active service that when the pistol was held in certain positions relative to the travel of the machine through the air the cartridge-cases were blown aside, and thus missed being trapped by the cage, the improved device was invented to overcome this fault.

In the new device the entrance to the cage passes right over the top of the breech, so that it is a mechanical impossibility for any cartridge-case to miss being projected into the cage. Naturally, sufficient clearance is allowed between the bottom of the guard and the top of the breech to enable the weapon to be sighted.

It has been found that considerable danger may arise in the use of an automatic pistol in an aeroplane through the cartridge shells flying about and hitting members of the crew, or getting caught in the propeller, or in any other moving parts of the machine. The earlier edition of the "R.F.C. Cartridge-Case Deflector," as the appliance is called, was distinctly a success, but the improved type of guard is likely to be still more popular.

The standard weapon of offence in an aeroplane in these days is a machine-gun, but a heavy-bore automatic pistol may prove quite a useful auxiliary if it is not allowed to be a danger to the

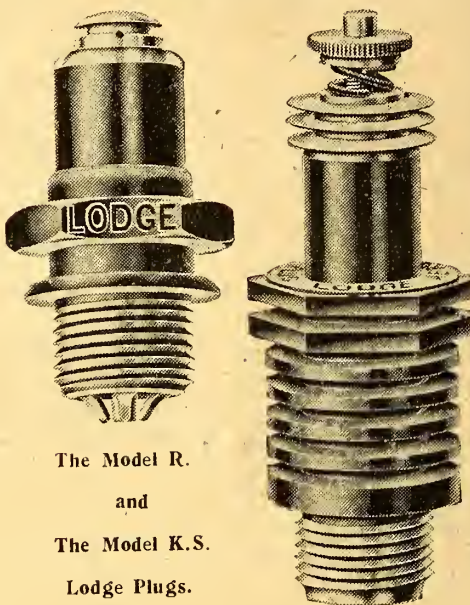
user, or his accomplice, and the general adoption of the Deflector will probably popularise the use of automatic pistols in aeroplanes, especially as in many aerial fights the combatant machines pass within a few yards of each other, and a hit by a .45 pistol bullet at close quarters is far more effective than the high-velocity small-bore, service rifle bullet which is used in British machine-guns, which, *inter alia*, have been known to jam at critical moments.

Incidentally, Mr. Evans is the proprietor of a thoroughly well-equipped shooting ground at Acton, only 10 minutes from Paddington, and those about to join either Flying Service may be glad to familiarise themselves with the use of fire-arms before reporting for duty.

NEW LODGE PLUGS.

The Lodge Sparking Plug Co., Ltd., whose postal address is

now simply Rugby, England, have just put two new patterns of plugs on the market. The famous Model "A" plug remains unaltered, and is now priced at 12s. 6d. The new types are the Model "KS," specially designed for stationary cylinder aero engines, and priced at 11s. 6d., and the Model "R," designed for rotary engines, and priced at 10s. 6d. each. The excellent ignition performance of the older type is sufficient guarantee of the reliability of the new models.



The Model R.

and

The Model K.S.

Lodge Plugs.

MORE TRIPLEX USES.

The use of Triplex Safety Glass in the aircraft industry is increasing rapidly. Starting in a small way in aviators' goggles, it demonstrated its efficacy so well and so frequently that it quickly became generally used in wind screens, both on aeroplanes and cars.

It is possible to make it in comparatively thin gauge, and consequently very light for its area, with the result that it is now becoming largely used for observation panels in various parts of modern aeroplanes. It has, of course, the immense advantage that it does not cloud up with age, and that it is entirely unaffected by oil or any other liquid.

A FREE GIFT.

If the gentleman who removed the spare rim, complete with tyre and tube, from Mr. N. Pemberton-Billing's car as it stood outside the Royal Aero Club a few nights ago, will apply to the rightful owner and prove his possession of the tyre, he will be presented with the four attachment straps, as Mr. Billing has no further use for them. [Why not the car also?—Ed.]

AN AMENDED DATE.

The date of the marriage of Mr. Sydney Pickles and Miss A. R. E. Marks has been amended from November 4th to November 3rd.

The ceremony will be of the quietest possible nature, owing to the war, and therefore no invitations will be issued.

RE PROFESSIONAL VACANCIES.

In response to the notice in THE AEROPLANE for Oct. 11th, inviting Works Managers and Designers to communicate with the Editor, a very large number of replies has been received.

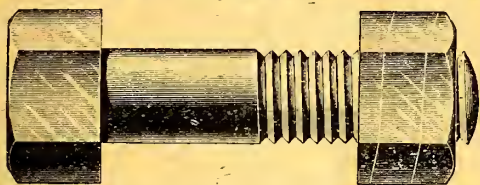
It is quite impossible to acknowledge all these individually, but the most suitable cases are being notified to the aircraft constructors who were in want of such men. The positions vacant are now filled, but the names of applicants are being registered for use as soon as other vacancies occur.

SCHOOL REPORTS.

AT THE GRAHAME-WHITE SCHOOL.

Instructors: Messrs. Manton, Winter, Pashley, Biard and Hale. Pupils with Instructor: (Landing practice) Messrs. Kaizer, Payne, Steeves, Green, Woods, Robertson, Travers, Sutherland. Straights with Instructor: Messrs. Ranson, Whiteman, Norris and Hitchcock.

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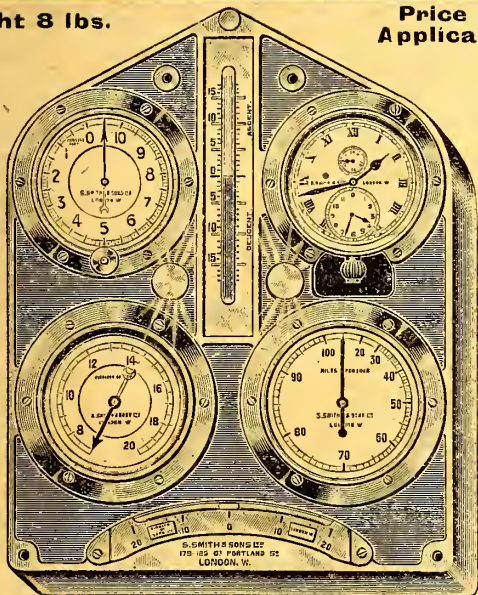
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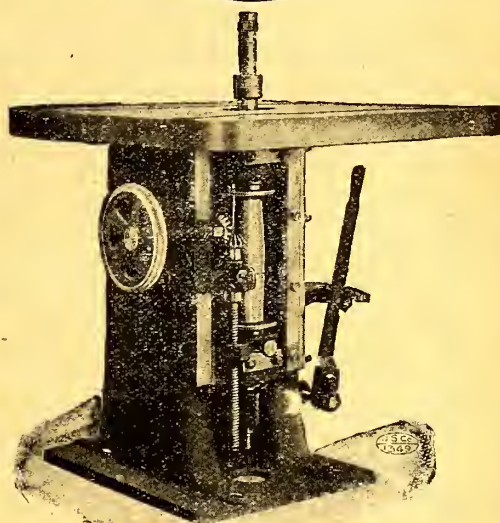


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WISDOM.

The following extract, from a brochure by one Lewis Hind, entitled "Wisdom," and from an article therein headed "The Soldier Boy," has been sent by an R.F.C. Officer:—

"All of us, even in ecstatic moments, are still of the earth, loving the spectacle of bright heroic things; and I, suddenly, at the sight of a corps of Flying Men swinging down the street, forget everything but them. These gay and jaunty bird-like men with their dandy caps, their tight uniforms and their air of responsible irresponsibility, are the new note of the war. They are like no other soldiers; they are not of the earth; the stars are their counsellors; they have taken on the freedom of the air, the unfettered mystery of space, and, in doing so, they have become quick and alert and remote like birds. The stupid streets are not for them; their home is towards the stars; they soar; they consort with the Everlasting Angels, who watch and talk gravely, with infinite wisdom, of our poor doings. O, to be a Bird Man to rise higher and higher, away from chatter and error to where the great heart of wisdom waits! Then in a flash knowledge came to me. The thought of the Bird Men and their untrammelled flight into space cleared my muddy brain. Wisdom iii, i. Why, of course, the old man was quoting from the Wisdom of Solomon."

The sender's comment reads:—

"The enclosed may be of some interest and be a 'source of universal merriment,' for more ghastly slush I have never read."

"In one thing only the author is right 'they are like no other soldiers,' and, 'remote-like . . ."

"Indignant Flight Sergeant to Bird-Man: 'Ere you—consorting with the Everlasting Angels as usual. . . why don't yer rise 'igher an 'igher like Mr. 'Ind tells yer?"

"Good Lord, it makes me ill to read it!"

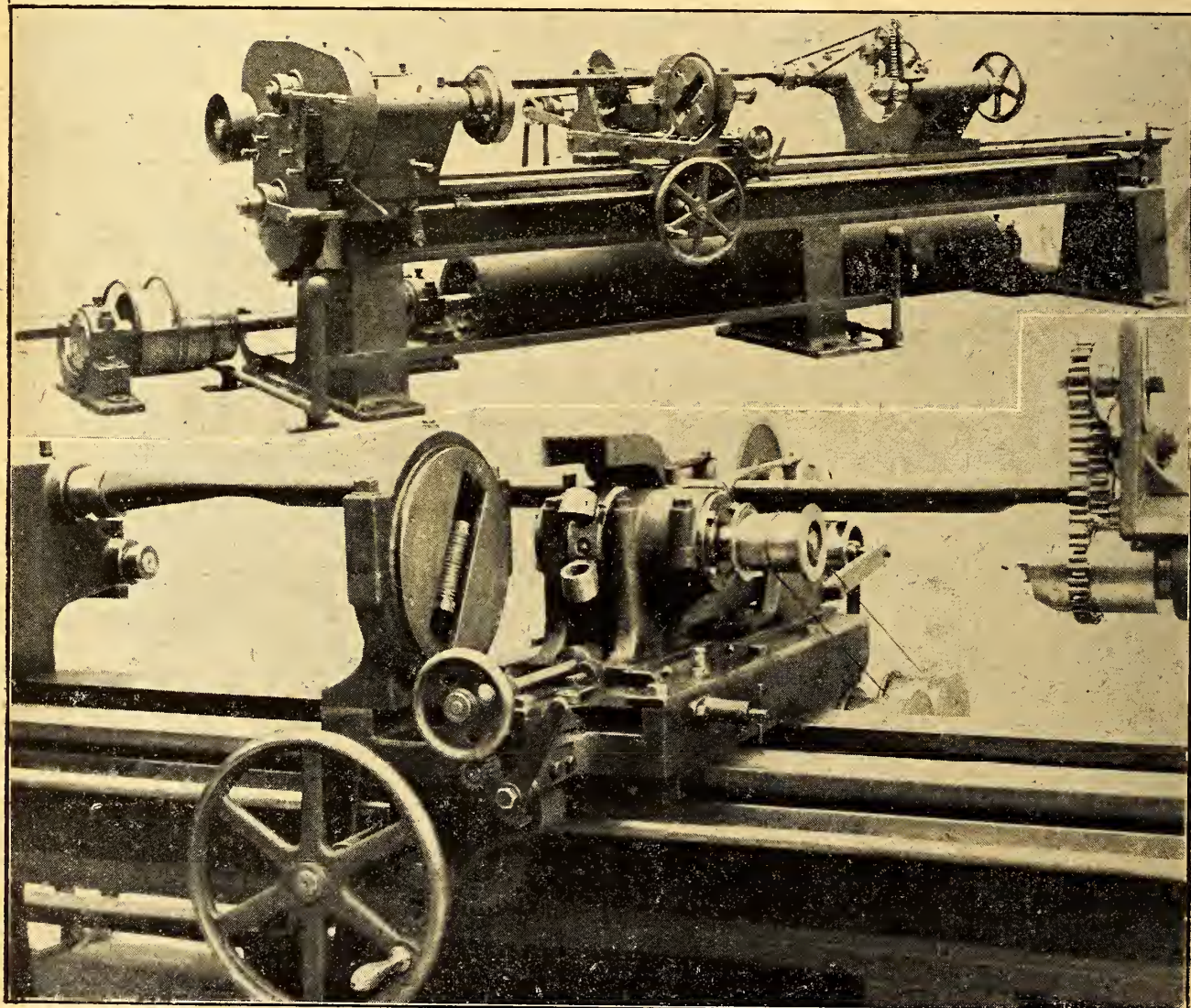
WOOD-WORKING PLANT.

The production of aeroplanes and their component parts has now reached such a state of standardisation that the work can only be turned out rapidly and economically by the use of labour-saving machinery.

A firm who are noted particularly for the production of wood-working machinery is J. Sagar and Co., Ltd., Canal Works, Halifax, England.

One of their products which is of particular interest to aeroplane constructors is a machine specially designed for copying the irregular forms assumed by aeroplane struts. This machine is illustrated. It will be seen that the cutting tools are guided in their work by a standard pattern.

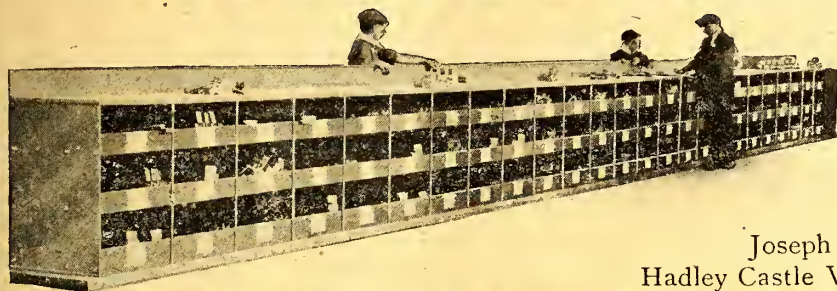
This machine is, of course, only one item of an enormous stock of machinery which Sagar and Co. carry, among the different items being sawing machines of all kinds, planing machines, and moulding machines of every pattern. Good deliveries can be made, and inquiries will receive prompt attention.—W. L. W.



An Ingenious Strut-Copying Machine made by J. Sagar and Co., Ltd., of Halifax.

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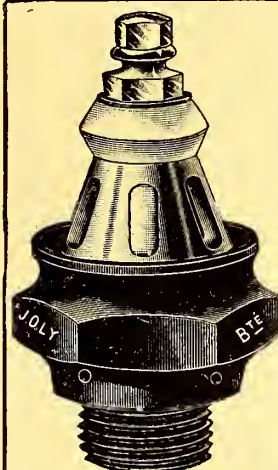
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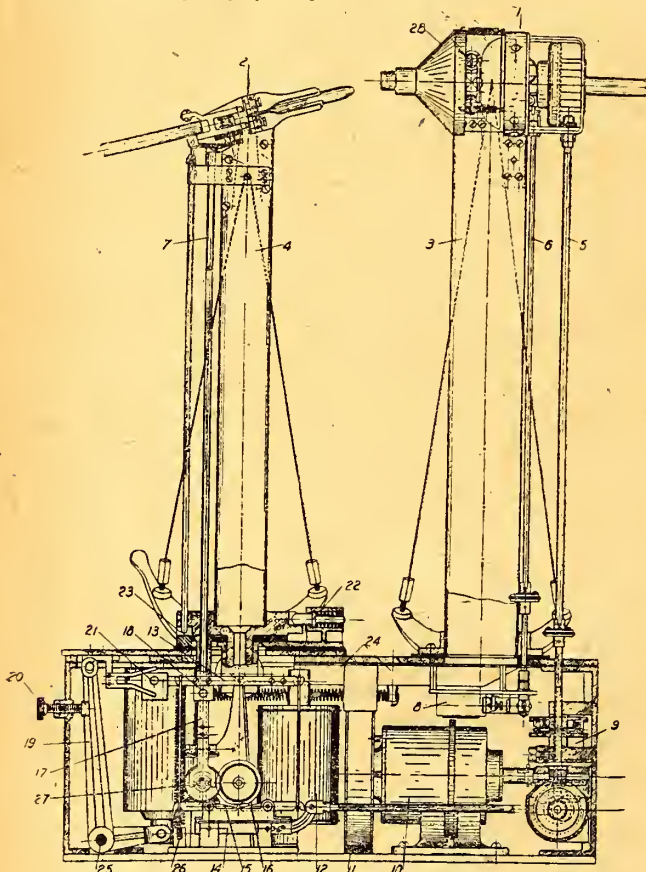
THE SPERRY SEARCHLIGHT.

Mr. Elmer A. Sperry, who is chiefly known in this country in connection with the Sperry gyroscope control for aeroplanes, is an electrical engineer of long standing. His latest triumph is the production of a searchlight whose performance is claimed to exceed that of anything previously turned out.

The following are extracts from an article by Captain Adelno Gibson, Coast Artillery Corps, in the "Aerial Age."

The essential feature of a successful searchlight is its illuminating unit, and Mr. Sperry has therefore worked to improve the electric arc light to adapt it more usefully to this purpose.

Up to the present the source of light which has been universally employed has been the positive crater of a pure carbon arc, carbon being selected as having the highest melting point of any known element. The highest brilliancy with the use of this material is a matter of 150 c.p. per square millimetre.

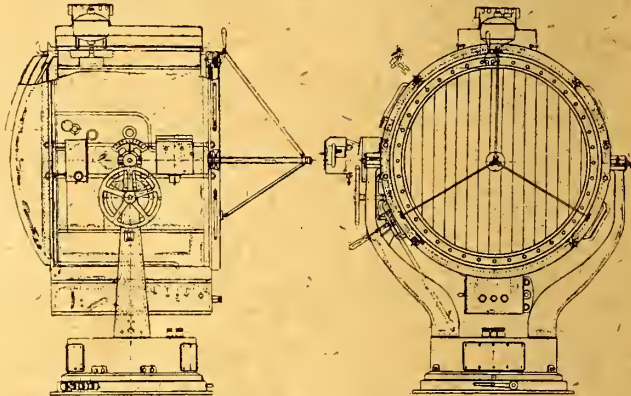


The Arc Generator of the Sperry Searchlight.

Greater brilliancy is obtained in the Sperry arc by making use, in addition to this heated crater surface, of a superheated gas produced in the arc. This superheated gas is formed from certain special materials with which the positive carbon is impregnated.

For the successful use of this bright vapour as a searchlight source, it is necessary that it be concentrated in a very small area. This is accomplished in the Sperry arc by maintaining a very deep crater in the positive carbon, into which crater this bright vapour is kept pressed. The force used to keep the vapour

pressed back into the crater of the positive carbon is the arc flame from the negative carbon, and is similar to the arc flame used in the old searchlight lamps. The vapour causes the mouth of the crater to emit a very intense illumination running as high as 500 c.p. per square mm. or 320,000 c.p. per square inch.



The Projector of the Sperry Searchlight.

For the standard 150 ampère arc the diameter of the positive carbon is $\frac{5}{8}$ inch, and that of the crater diameter somewhat less. The diameter of the negative carbon is only $\frac{7}{16}$ inch, and with its small holder casts a very small shadow on the centre of the mirror, thus adding more reflected light to the beam.

The nature of the light consumes the positive carbon very rapidly, and a very long carbon (44 inches) is therefore provided.

Fig. 1 shows an elevation of the Sperry arc lamp. The control box contains a shunt wound motor (10) direct connected both to a centrifugal blower (11) and a gear train for the feeding and rotating mechanism. The blower furnishes air through passages (3) and (4) to the positive and negative carbon holders respectively. The air supplied to the positive holder is forced between a number of heat radiating discs which surround the end of the holder nearest the arc. The cap (28) is open on the upper side to allow the air to escape from the positive holder. This method cools the positive carbon and also removes the heat from the mechanism of the positive carbon holder received chiefly by direct radiation from the arc.

The positive carbon is rotated, being connected to the motor (10) through a vertical shaft (5) and a worm gear, a small crank carrying a crown gear, which engages a gear on the vertical shaft, is used to rotate the carbon by hand if necessary.

The positive feed is operated by thermostatic control of the solenoids (8) through the vertical shaft (6). The thermostat is mounted on the drum and so arranged that when the positive carbon burns out of the focal point of the mirror the heat from its crater is brought on to the thermostat, causing feed of the positive carbon until the focal point is again reached. This auto-

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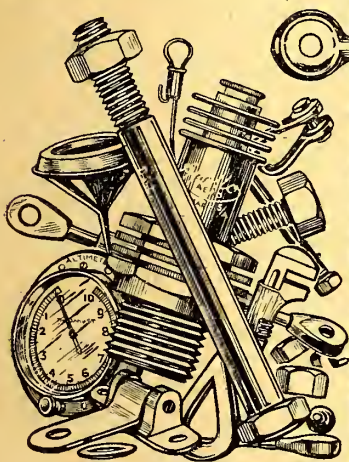
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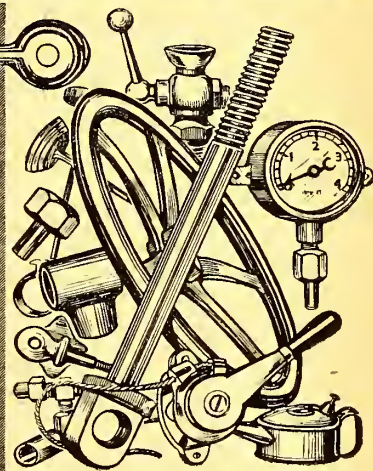
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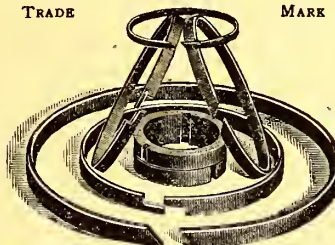
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matic control of the positive carbon is also supplemented by hand control.

The feed of the negative carbon is controlled by the solenoid (12) connected directly across the arc and moves the carbon in the proper direction as the voltage rises or falls. The automatic feed of the negative carbon is also supplemented by hand control. A striking solenoid (21) moves the entire negative holder back the proper arc length on striking of the arc.

A rheostat is used in series with the arc, adjusted so as to obtain a voltage across the arc of about 75 volts.

The Sperry Gyroscope Company are using this arc in search-lights of 24, 30 and 60 inches diameter.

There seems great possibilities in this arc for anti-aircraft work, giving as it does a matter of 100,000 c.p. in the flame produced.

GERMANY'S LATEST.

Copies of "Notschrei," a "Cry of Distress," a poem calling upon the German authorities to resume unrestricted submarine warfare and relentless Zeppelin raids, have reached New York from Germany addressed to German-Americans with the request that they should be given circulation in South America. The poem, the author of which is anonymous, is to be widely distributed in Germany.

The following two are typical verses:—

Kaiser, my Kaiser, a marvel 't were
Could thy people's mutterings reach thine ear.
We have Zeppelins plenty to fill the sky;
Over to England bid them fly.
Blast docks and arsenals all beneath,
Blow their city to dust and death.
Thou, grey old Count, to the Kaiser cry,
"Fly, Zeppelins, fly."

["Fry, Zeppelins, fry," might seem more apposite, judging by recent performances.—Ed.]

This is the next verse:—

Pity's a sin for women fit,
When the people's blood must flow for it.
It is life or death.
What is needed here
Is a heart that knows not mercy or fear.
Germany, famine is on thee now!
Thy weapon use or thy knee shall bow.
Thy direfulest weapon, the dread of the foe.
Go, U boats, go.

[On the whole, one prefers the "Hymn of Hate," as being more virile, and one fancies that the Services will agree. It appears that the "Hymn of Hate" is particularly popular in the Fleet, ever since some sporting officer imported sundry copies via a neutral country. One can imagine the puzzlement of an Unterseeboot's skipper if he came to the surface near an unsuspected British warship, and heard the Ward Room chanting the "Hymn of Hate" in chorus as an after-dinner ritual—as one gathers is the custom on some ships. English humour is a continual puzzle to the Hun.—Ed.]

TO THE R.A.F. ENGINE.

Eight little cylinders sitting facing heaven.
One blew its head off
Then there were seven.

Seven little cylinders used to playing tricks,
One warped its inlet valve,
Then there were six.

Six little cylinders working all alive,
One got a sooted plug
Then there were five.

Five little cylinders working all the more,
One overworked itself,
Then there were four.

Four little cylinders flying o'er the sea,
One shed a piston-ring,
Then there were three.

Three little cylinders wondering what to do,
One over-oiled itself,
Then there were two.

Two little cylinders, very nearly done,
One broke a valve-stem,
Then there was one.

One little cylinder trying to pull round seven,
At length gave up its efforts,
And ascended into heaven.

R. A. R. S.

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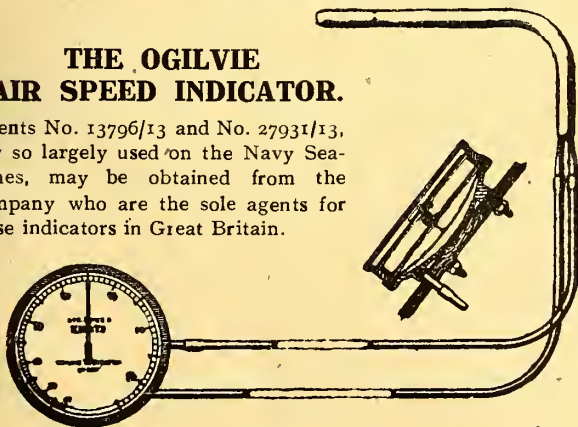
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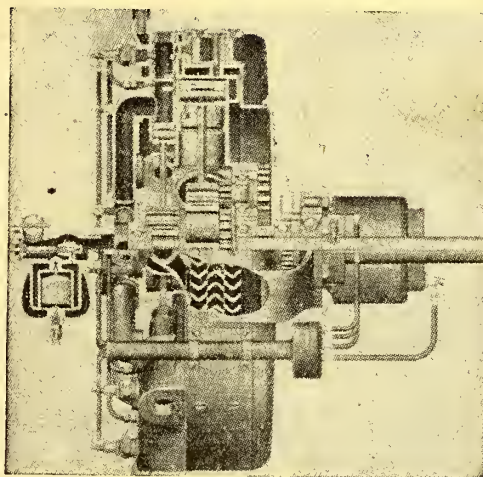
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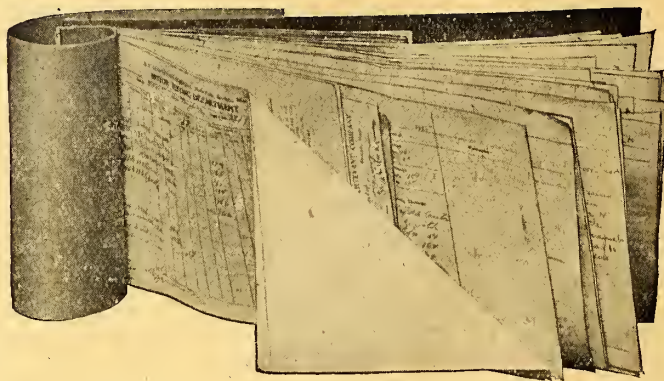
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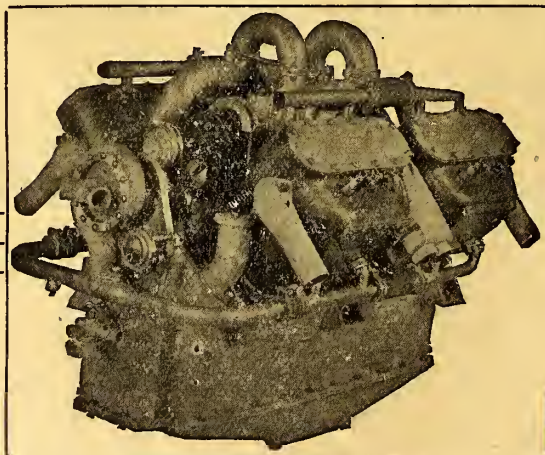
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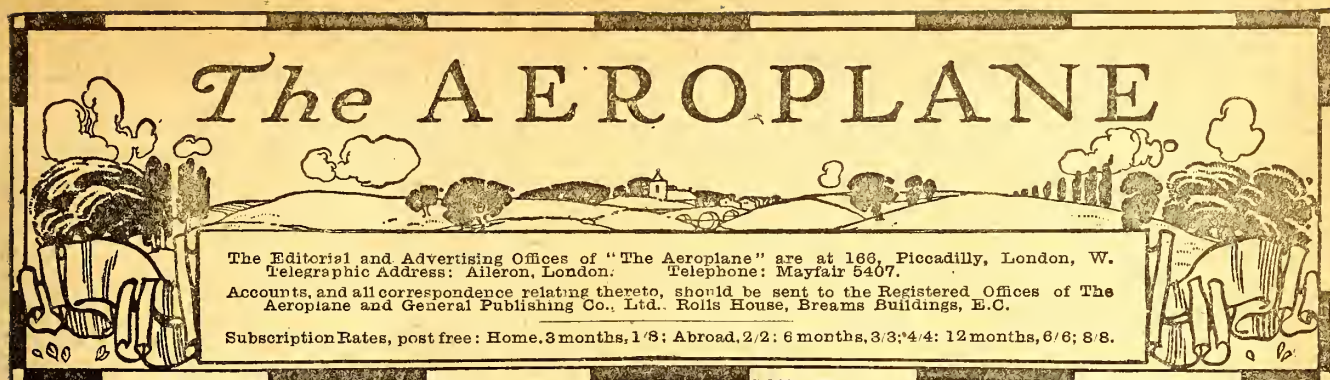
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ON THINGS THAT MIGHT BE BETTER.

Be it noted that, though what follows hereafter may consist chiefly of criticism of things as they are, the said criticism is not produced in any carping or captious spirit, but purely because things which are good may always be better and ought to be best.

There are three degrees of comparison in everything. As a famous judge once remarked, "There are three degrees of liars. Liars: damned liars: and expert witnesses." One might without much effort produce a paraphrase concerning scientific quacks, in which "Government experts" would occupy the superlative position.

An ancient American saying—assuming that one dare apply the epithet ancient to anything American—bids you "Hitch your wagon to a star." Which inculcates much the same moral as the late the Reverend Mr. Dodgson's cryptic reply, "Because the higher the fewer," or the more homely "There is always room at the top," or "The higher you aim the higher you hit." Or, to put it more ordinarily, the higher your ideals the higher will be your attainments.

Now I take it that the ideal of everyone concerned with aeronautical affairs, apart from those who are merely in the game for the plunder they can make out of it while aviation is booming, is that the British Empire shall some day hold the absolute command of the air even more completely than it now holds the command of the sea.

It being granted that we hold command of the surface, and have made the submarine activities of our enemies unpleasant and expensive, it still remains a fact that a submerged submarine is invisible, and that, though an invisible submarine may be caught, it certainly has a sporting chance of escape from superior forces. The ideal to be attained in the air is the more attainable, because it is impossible, despite darkness and clouds, for hostile aircraft to hide themselves utterly, as a submarine can hide itself.

Therefore the absolute command of the air can be obtained by any country which is able and is prepared to produce aircraft of the necessary quality and in the necessary quantity.

The British Empire has the ability to produce. It remains to be seen whether future Governments will have the ability to see the need for such production. Experience does not lead to optimism in such a matter, and the present Government may be left out of one's reckoning where patriotic ideals are concerned.

Yet in certain ways the command of the air is a more difficult and a much greater thing to obtain than is the command of the sea, simply because area increases as the square of the dimensions. Which is to say that, while one may blockade an enemy's coast-line with a sea fleet of two keels to one, one cannot blockade an enemy's superficial area with an air fleet which is double his in size.

Moreover, in blockading an enemy coast there are only certain well-defined points from which his fleet can put

to sea, whereas his air fleet can put to air from an indefinite number of points over the area of his country.

These matters may well be discussed in greater detail after the war, when more freedom of expression is possible, but meantime the absolute command of the air must be the aim and ideal of everyone concerned with aeronautics in the British Empire.

TOWARDS THE IDEAL.

It seems fairly obvious that, while the present war is in full blast, the ideal set forth hereinbefore is unattainable, but much progress may be made towards it. Only those of us who knew the muddle and incompetence which existed somewhere about a year ago can realise how much the Empire owes to that little group of very able officers who have in less than twelve months made the Royal Flying Corps the great force it is to-day.

The intelligent and diligent Hun doubtless keeps an accurate account of the growth of the R.F.C., so that, though the Army List is no longer available to those interested in the British Army, the German Imperial General Staff has probably a perfectly good record of each corps and regiment, compiled day by day from a profit and loss account struck between the appointments and promotions notified in the "London Gazette" on the one hand, after deducting retirements and dismissals, and the Casualty List on the other hand. The Hun, being a practical mathematician and a first-class book-keeper, can doubtless form a fair estimate of the number of flying officers appointed on probation who are likely to be confirmed in their rank, and of the number of those who are likely to become useful pilots.

He knows precisely the value as a striking force of the R.F.C. as it is to-day. In fact, he knows its value from bitter experience very much better than we do. And consequently he can calculate what its value is going to be twelve months hence, for he probably has the sense to realise that its value will increase as the square of its numbers (*vide* what "Professor" Lanchester has called the " n^2 Law"), and that its numbers will go on increasing in not less than the same ratio as they have done in the past twelve months. At least, if the Hun does not know, I have much pleasure in presenting him with the information.

BETTER SUPPLY OF MATÉRIEL.

Now, the enormous increase in the personnel of the R.F.C., which anyone can perceive who cares to compare the "Gazettes" of to-day with those of a year ago, means that a corresponding increase in matériel must take place. When Lord Montagu and others, who were looked upon twelve months ago as wild enthusiasts, talked about 10,000 aeroplanes as a reasonable air fleet, people in official positions scoffed at the notion. Yet 10,000 aeroplanes to-day is looked upon as a reasonable figure for discussion.

An annual output of 10,000 machines is really nothing extraordinary, for it only means about 200 machines a

week. Or say 10 machines a week each from 20 different factories. One cannot, naturally, say whether we are already turning out that number, or whether we are doing more, for such information would be useful to the enemy, but one can say that such an output would not be wildly exciting. I take the figure as a basis of discussion merely because it has been so frequently mentioned.

It is necessary, however, to remember that the average life of a military aeroplane is not more than three months. Some survive for a year or more. Some are smashed the very day they are delivered. In fact, one officer is credited with having successfully deleted three brand-new machines of a new type on three successive days, each within an hour or so of its delivery to his squadron. Consequently, three months is a fair estimate for the life of an aeroplane.

In parentheses, let us agree that by "an aeroplane" we are to understand the ordinary pusher or tractor two-seater or three-seater, with an engine of anything between 100 h.p. and 250 h.p.; for if we import into the discussion multiple-engined colosso-planes capable of lifting some odd tons of frightfulness or a crew running into dozens, our figures cannot convey any definite ideas. Such huge brutes naturally cost far more in man-hours and material than do machines of what one may call "standard size."

BETTER USE OF TIME.

Now, allowing that an aeroplane is only going to live three months, it means that, if our output is only 10,000 machines a year, we can only maintain 2,500 machines in the field. The pre-war establishment of the R.F.C. laid down that each Squadron was to consist of 12 machines, with an equal number in reserve—or 24 machines per squadron—so that an annual output of 10,000 machines would only equip 100 squadrons. And there would be nothing left for the Navy or for training purposes.

Whence it is obvious that, if the R.F.C. in the field is to do merely what the Army requires of it in France, in the Balkans, and in Egypt, not to mention the requirements for police work in India and the Soudan, a 10,000 per annum output would be none too many. And if overwhelming air raids are ever to be made into German territory, as one hopes they will be some day soon, by fleets of not less than 100 machines at a time, a yearly 10,000 machines would have to be doubled or quadrupled.

And when it comes to speeding up output, time is the essence of the contract. Money alone can do nothing.

BETTER MAN-POWER.

People are apt to forget that the unit of value is not actually the gold token known variously as a sovereign, a pound, a quid, a Jimmy, or a thick 'un—according to the society in which it is being discussed. The real unit of value is the man-hour. Gold, coal, iron, wheat; meat, even beer and tobacco, are worth nothing until a certain number of men have laboured a certain number of hours to produce the finished article and to transport it into the hands of the consumer. Consequently the real value of an article is the number of man-hours spent in producing and transporting it. One man's work is worth more than another's, it is true, but that merely means that, if an ordinarily good man—of, say, standard worth—does one man-hour of work per hour, a better man may do 2 man-hours, and a superlative man may do 3 or 4 man-hours in the same time.

I have seen it calculated by a works manager that an ordinary two-seater aeroplane, in what the R.F.C. is pleased to call the "glider" state—that is to say, complete, but without its engine and tanks, and without any unusual gadgets and fittings—takes 4,000 man-hours to build from timber in the plauk and metal in the sheet or tube. He arrived at that figure by averaging up

the work put in by all the degrees of goodness and badness among the men, and including boys, improvers, and helpers generally, but excluding all office expenses.

This figure works out quite well in practice. For example, a factory with 400 men, working 10 hours a day each—that is to say, 8 hours ordinary time and 2 hours overtime—does 4,000 man-hours per day. Which means an aeroplane per day, or 6 aeroplanes per week. Quite a reasonable figure.

Ten thousand aeroplanes per annum means 200 per week, or, roughly, the output of 33 factories of 400 men each. Which would mean about 13,000 men engaged in making aeroplanes alone, without counting those making engines and other things that have to be bought in a finished state from firms of specialists or from allied industries.

THE MONEY STANDARD.

That 4,000 man-hours per aeroplane is by no means a bad figure on which to base calculations when discussing the value of an aeroplane either in money or man-hours, for 4,000 man-hours represents about £200, taking the average wage at 1s. an hour. If one adds cost of material and establishment charges to that, if one puts on a share of selling and management expenses, and then adds a reasonable profit, plus some more for war-profit taxation, one soon exceeds £1,000.

If, however, one is working to R.A.F. designs, under Government inspection of one sort or another, which means working to uncommercial limits from unnecessarily complicated designs, with unusual materials, the costs go up enormously. Much perfectly good work is scrapped, either because the design is difficult to make, or because the limiting sizes are so fine that the best workmen produce an undue proportion of rejects, or because the material is tricky and breaks up in the process of manufacture, or because official drawings are wrong and articles made to them have to be scrapped. Double-buttressed suaged fuselage wires, all of different lengths, and streamlined bracing wires all add to the cost; so between genuinely expensive material which may be worth while, such as these, and unnecessary waste of man-hours, the machine which might cost £1,000 without its engine may run up to £2,000 or more, and still not show its manufacturer a reasonable profit.

BETTER USE OF MEN.

In war-time money is no object—a fact of which many young officers seem perfectly aware, if one may judge by their antics when placed in sole charge of many thousands of pounds' worth of the nation's property on land or sea or in the air. The nation can always borrow money from one pocket and put it into another—as the pockets of sundry friendly aliens demonstrate, as well as those of our own munitioneers. The one thing one cannot borrow, or import, is man-hours.

This is particularly true of aircraft production. The Army wants more and more men, so that there is no reserve stock of hands on which to draw. In fact, there is likely to be a combing out of the Aircraft Industry, and a very good thing too, if one may judge by the number of young men one sees in various capacities, who cannot possibly have been long enough in the industry to be genuinely skilled workmen who cannot be replaced.

Incidentally, it seems that many of these precious delegates who are trying to work up strikes and discontent among the men, many of whom are already too highly paid, are themselves physically fit for general service and well under age—and I do not think anyone would describe them as indispensable—so I hope the Military Authorities will look some of them over carefully.

Anyhow, it seems fairly obvious that the Aircraft Industry cannot have many more men. And it is certain that the men cannot put in any more hours per day per

man. So that limits the number of man-hours available for the Industry. The problem, therefore, is to increase the value of the man-hour in actual production, and that ought to be by no means difficult.

BETTER MAN-HOUR VALUE.

There are two ways of getting better value for the man-hour. One is by decreasing the amount of labour wasted in producing stuff which is scrapped, and the other is by decreasing the number of non-productive hands and turning them into producers.

We have read much of late, concerning other industries, of viewers who do not view and inspectors who do not inspect. Also we have read of direct and indirect graft and bribery. On the whole, the Aircraft Industry is probably freer from corruption than most of the older industries, but it does certainly seem to suffer from an excessive number of non-producers.

Both the R.N.A.S. and the R.F.C. employ vast numbers of viewers and examiners and inspectors, and one cannot help thinking that many of them would be better employed as producers.

Quite a goodly number of R.N.V.R. officers who have soft jobs in aircraft factories are young unmarried men, or fairly well-to-do married men of military age and fitness, who had no connection with aircraft before the war, and whose technical knowledge is not so great as to justify the plea that they are indispensable. These men ought to be drafted into the combatant branch of the Air Service, instead of being allowed to promenade in uniform and do nothing. Man-hours in the R.N.A.S. seem to be of no particular value in official estimation. A cynic has said that, where aeroplane inspection is concerned, R.N.V.R. stands for really not very risky.

And when they were weeded out there would still be enough of the older or more technical men left to do all that is required of their branch of the Service.

Much the same thing is true of the R.F.C., though, on the whole, most of the A.I.D. officers and technical officers in other branches of the Flying Corps have an actual working knowledge of their jobs.

Where the saving could best be made is in the lower grades, where examiners and viewers in both Services are simply falling over one another, duplicating one another's work and getting in one another's way.

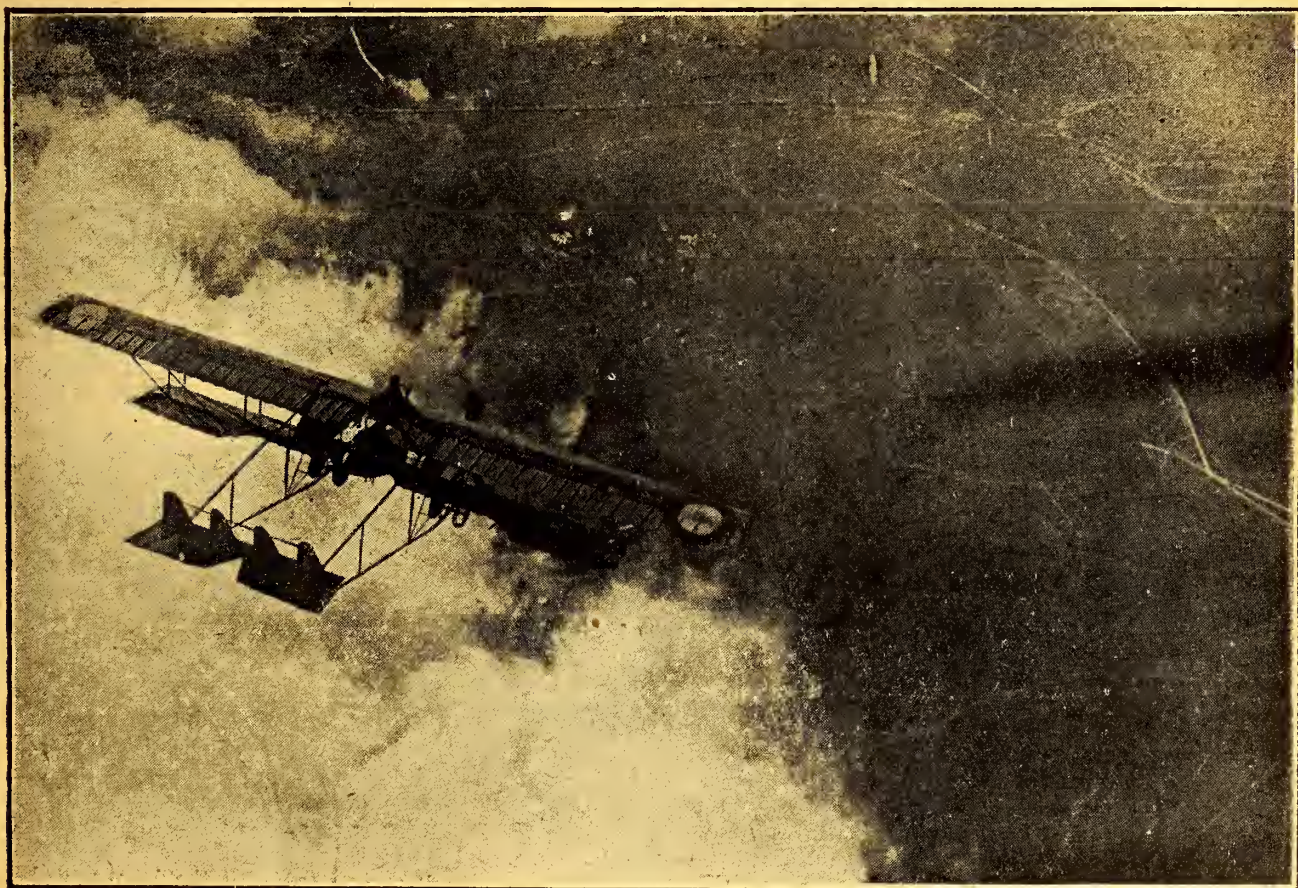
There is, hereabouts, a strong argument in favour of having one single Authority to control output, much as the Ministry of Munitions controls the output of guns and ammunition for both Services, or even for handing the problem of supply over bodily to the Ministry of Munitions.

BETTER INSPECTION AND LESS OF IT.

Personally I am of the opinion that all the R.N.A.S., A.I.D., and R.A.F. viewers and examiners should be abolished, and the onus of examination placed on the manufacturer. If, instead of having every minute part examined, and gauged, and tested, and analysed, and generally fiddled about by Government employees, the finished product were inspected as a whole by a first-class man who really knew his job, the output would undoubtedly be better in quantity and quality, and hundreds, if not thousands, of men could be released for productive work or for drafting into the Army.

If a wing were examined as a complete wing before covering, and ruthlessly rejected if defective in any detail, the manufacturer would take excellent care that there were no defective details. And all the men who now waste their time examining ribs, and screws, and wires, and turn-buckles, and so forth would be set free for more useful work. Similarly with complete fuselages and complete tail units.

As it is, the manufacturer can always turn round, if



OVER THE CLOUDS.—An official photograph of a Twin-engined Caudron Biplane on reconnaissance in France.

anything goes wrong, and say, "Well, your people examined every detail, so don't blame me."

A WORKER'S VIEW.

A letter from a man in one of the biggest aircraft factories rather bears out this view. Referring to a recent article in this paper, he says: "You state, 'It would not be safe to leave too much responsibility in the hands of the inspection staff.' It is a pity a good many firms do not look at it in this way instead of relying on the A.I.D. to pull them up." In other words, let the manufacturer take the responsibility for his work, and cut out all the A.I.D. examination till the finished article is passed or rejected.

The same writer says further: "The new A.I.D. official uniform in nearly every case means 'swank' when these individuals have to mix with mere unfortunate civilians employed in aircraft factories. We are told that the uniform helps these A.I.D. officers to go about where civilian clothes might 'stick,' and consequently more paper matter would have to be carried. It sounds well!" The point is worth noting by the senior A.I.D. officers. It was inevitable that some undesirables should come into the Department when it expanded so rapidly, but every endeavour should be made by the Administration to maintain the high tradition of the A.I.D. as founded by the late Colonel Fulton. His successors would be the last people to profess that they fill his place adequately, but they can do much to keep up the standard of technical ability and personal behaviour which he set in the lower grades of his department.

The writer already quoted says further: "We know the A.I.D. girls are doing their bit, but is it right that they should inspect material, being in nearly all cases less capable of judging the work of the workmen who have made it than the men themselves? It would also be interesting to know where these ladies got their training, and who are their male friends and relations connected with the A.I.D. Perhaps you may have other people's views on the subject."

He has floored me there. Presumably he refers to girl viewers of small metal parts and so forth, who have to gauge them for size. I do not know of any girl examiners or inspectors whose job it is to judge quality of workmanship or suitability of material. If any such exist, then someone in the A.I.D. seems to have made a fearsome mistake. As viewers, girls are frequently very good, having a light and sensitive touch in gauging work; but, even so, one fails to see why the A.I.D. needs them. They should be employed by the manufacturer, and, if this work is being duplicated, then one lot of them should be put onto productive work.

As regards inspection of raw material, this is a job for highly trained men only. The A.I.D. should certainly retain a few specialists in timber and in metals, to examine raw material in bulk, just to know exactly what the manufacturers are using, but there is no need for A.I.D. examination of every scrap of material used. The responsibility for this should be put onto the manufacturer, under heavy penalties in case of failure.

BETTER DIRECTION OF OUTPUT.

What really seems to be badly needed in the R.F.C. is a Director of Output. Presumably he would have to be an officer, though he need not be a trained soldier—in fact, no soldier could have the experience he would need. He ought to be a trained engineer, and a first-class business man also. He ought to have some experience of aircraft work in one or other of its branches. He ought to have, above all things, experience of handling men and of pushing up output under pressure. He ought to have the knack of making himself popular, but he ought also to be able to be thoroughly offensive when necessary. He ought

to have a good deal of the slave-driver about him, and yet be able to persuade where driving would not pay, and he ought to have the sense to know when to do which. He ought also to be so situated personally that he would have no axe to grind, except the ambition to gain honour for himself by doing his job better than anyone could ever have expected. And he ought to be above bothering what he was paid for the work.

Such men do exist. I know one or two actually in the Aircraft Industry, strange as it may seem. It would be no sort of job for a consulting engineer, who might want £3,000 a year or so for doing it, but it might suit a man with a private income to do it on a colonel's or brigadier's ordinary Army pay.

Such an officer would have to go round the whole Aircraft Industry constantly, finding out all troubles which were holding back output, and making suggestions, or giving orders if necessary, to increase it. He would have the job of cutting down non-producers and setting more producers to work. In fact, he would be a sort of very much glorified "chaser," such as exists in every factory worthy of the name.

If such a man were found, and were given the power to do his job properly, it is certain that the output of aircraft could be enormously increased. The number of producers could be increased, the number of non-producers could be decreased, and quite a little crowd of able-bodied young men, both in and out of Government employment, could be released for the Army.

BETTER COMBING OUT.

One of his most important jobs would be to decide whether a young man's technical knowledge, or rather his practical knowledge, was sufficiently great to make him of greater value in a workshop than in a trench. The factories of this country, including aircraft factories, hold many unmarried men between 20 and 35 years of age, whose experience of mechanical work has all been picked up in the last year or so.

They cannot possibly be really skilled workmen, yet they are safely protected behind their munition badges, while older married men, many with years of workshop experience, have to break up comfortable homes and leave their wives and families to starve on a private soldier's miserable separation allowance while they go and fight for the young trench-dodgers who will breed a generation of slackers hereafter.

BETTER TESTING OF NEW TYPES.

Another little matter that might be improved is the testing of new type machines. I heard the other day, by a curiously indirect but none the less reliable route, of a new machine designed and built by a commercial firm which has a very remarkable performance. This machine went to an official aerodrome for test. Official instructions were sent that on no account was the machine to be tested without several hundreds of pounds weight of bombs on board. It is true that the machine was built as a bomb-dropper, but its performance suggested that it would be worth while to see what it could do without the weight of the bombs, as a high-speed reconnaissance machine or as a fighter.

Unfortunately, if its performance minus the bombs turned out extraordinarily good, it would eclipse the performance of a certain officially designed machine, with a large R.A.F. engine, and then the only honest thing for the Authorities to do would be to wash out the official design and have the commercial design built in hundreds by sub-contractors, in place of the official design. Which may seem to some people an adequate reason for insisting on the commercial design carrying the extra load when being tested.

Consequently it was tested with the bombs, and was not tested flying light. The cream of the joke is that,

. The .

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even when carrying the extra odd hundreds of pounds, it proceeded to pulverise all the records of the officially designed machine.

Now, the point for consideration is, do the Authorities who are responsible for such tests want the best possible machine, or do they merely want to justify the official designs by handicapping better designs? Any consulting engineer who was worth his salt would advise his principals to buy the best article, whether he himself was previously interested in a rival production or not, and one assumes that the officials responsible for providing machines for the Flying Services, whether genuine officers or merely civilians in uniform, are there to get the best possible aeroplanes. If they are not out for the best machines, regardless of official or personal influence, then they are unfit to hold their positions.

In any case, it seems obvious that every aeroplane should be given a perfectly fair test, and that orders should be allocated accordingly. Therefore it seems that better arrangements should be made for testing new types, so that results cannot be influenced in any way. Be it said, however, that, so far as the actual carrying out of tests is concerned, the timing, measuring, and checking is done with unimpeachable honesty, being chiefly in the hands of active-service officers, who know how much it means to the pilot to know exactly what his machine can do.

BETTER SCIENTIFIC RESEARCH.

In yet another direction there seems room for improvement. In the past the National Physical Laboratory has carried out more or less accurate research work, and has published so much of the results as it chose to publish in a bulky volume which generally appeared when its information was a year stale. Aeroplane makers were privileged to have experiments, more or less inconclusive, carried out for them at very high fees.

AIRCRAFT IN THE HOUSE.

"TRACER" BULLETS.

On October 17th, 1916, Colonel Norton Griffiths asked the Secretary of State for War whether certain of our aviators have been captured with "tracer" bullets used for range finding with machine-guns in their possession, and, in consequence, are awaiting court martial, and are in imminent danger of being sentenced to death; whether "tracer" bullets have been found on Zeppelin raiders captured in this country; and, if so, whether he will see that the same penalties are imposed upon them as are imposed upon our aviators by the enemy?

Mr. Lloyd George: It is probable that some officers or men of the Royal Flying Corps who have been captured have had "tracer" bullets used for range-finding in their aeroplanes. Cartridges with explosive bullets were found in one of the German airships which were brought down in this country. As my hon. Friend has already stated in reply to the hon. Member for Bethnal Green, the Army Council have no official information as to any court martials of prisoners of the Royal Flying Corps.

[Surely, it would not have been *ultra vires* for Mr. Lloyd George to have intimated that the question should have been addressed to the First Lord of the Admiralty, or for Mr. Balfour or Dr. Macnamara to have volunteered a reply to it.—Ed.]

Of late the usual reports have not been published, because some of the results might convey information to the enemy, although probably Göttingen knows more than Teddington. But it also appears that mere commercial aeroplane firms have had great difficulty in having tests made by the N.P.L., because the testing and experimental plant is so fully occupied with work for the Royal Aircraft Factory.

Now, if the N.P.L. is a national affair, why should the R.A.F. have a monopoly of it? And why should commercial firms be debarred, not only from having their own products tested, but from learning the results of tests made for the R.A.F.? This is using public money to create a monopoly in scientific knowledge.

Every aeroplane designer engaged on Government work should have a prescriptive right to go down to the N.P.L. and demand to be supplied with all the latest information obtained at that establishment. Otherwise the Authorities are not using the best brains of the country to the best advantage, for they are depriving them of information obtained by Government servants whose wages are being paid by the very firms to whom information is denied.

One hopes that the Government Advisory Committee for Aeronautics will look into this matter, and will realise that it can do more to help to win the war by providing aircraft manufacturers with the results of N.P.L. experiments than it can by issuing non-informative self-laudatory pamphlets at intervals, as has been its custom in the past.

There are several other things which might be better in connection with aircraft and the war, but perhaps the few points mentioned hereinbefore may suffice for the time being to provide food for thought for some of those in high places. Certainly, if the High Authorities set to work to improve even these little matters, they will be kept fairly busy for a while.

C. G. G.

THE CUFFLEY AIRSHIP.

Mr. Billing asked the Secretary of State for War whether he is now prepared to make a statement as to the type of airship brought down at Cuffley on the night of Sept. 3rd?

Major Baird (representing the Air Board): I have been asked by my right hon. Friend to reply to this question. I regret that I can only do so in the negative.

Mr. Billing: Is the hon. and gallant Gentleman prepared to make the official statement on the floor of this House that the airship in question was a Zeppelin?

Major Baird: I am afraid I can add nothing to the answer I then gave.

MONETARY REWARDS.

Mr. Billing asked the Secretary of State for War whether his attention has been called to the monetary rewards now offered by civilians to soldiers or sailors for the fulfilment of their duties; whether he is aware that, on the occasion of the first Zeppelin being brought down by an aviator, the First Lord of the Admiralty refused to allow Flight Sub-Lieutenant Warneford to accept the monetary rewards offered; and whether the War Office and the Admiralty view the dignity of the Services from a different standpoint?

Mr. Lloyd George: So far as this question relates to Naval offi-



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cers it should be addressed to the First Lord of the Admiralty. The answer to the first part of the question is in the affirmative, and to the last part, that a Regulation by which the Army Council is empowered to forbid an officer to accept a gift is about to be issued.

SPECIAL DISTINCTION FOR AVIATORS.

Mr. Billing asked the Secretary of State for War whether, in view of the fact of the exceptional individual heroism necessary and peculiar to the duties of an aviator on active service, more especially in engaging a Zeppelin in darkness, he will advise His Majesty to create a special distinction for aviators.

Mr. Lloyd George: In war time the awards which are open to officers and men of the Army are considered to be adequate for services of any nature.

[Mr. Billing's suggestion is not without merit, if only because a special decoration for aviators would prevent any invidious comparisons between the relative merits of the officer who fights in the air and comes home to a comfortable billet afterwards, and the officer who lives and eats and fights in a trench for days at a stretch.—Ed.]

NORTH-WEST COUNTIES.

Mr. Hodge asked whether any information can be given as to the more efficient protection of the North-West counties against aircraft raids?

Major Baird: I regret that I cannot make any detailed statement as to the disposition of the defences against air raids, but I can assure my hon. Friend that their development as regards all the areas which might be attacked is being steadily pursued.

[And, apparently, is not likely to be caught.—Ed.]

ADMIRALTY COMMISSIONS.

On Oct. 17th **Sir Charles Henry** asked the number of those of military age in the service of the Admiralty on Sept. 30th who had received commissions, and who, since the beginning of the War, have not been engaged in active naval or military service?

Dr. Macnamara, in a written answer, said: There are eighty officers of military age, with temporary commissions, now serving at the Admiralty who have not been engaged in actual naval or military service since the beginning of the war. Nearly all of these are employed in the Air Department in connection with the design and production of material for the Royal Naval Air Service, and were entered for this and no other purpose.

[One might suggest that it would be a good thing if some of the officers who hold permanent commissions were sent out to see some active service in the air. There might be an improvement in the provision of material if such a thing were done.—Ed.]

"TANKS" (ORIGIN OF CONSTRUCTION).

On Oct. 18th **Captain Burgoyne** asked the First Lord of the Admiralty whether the idea of the armoured cars known as "tanks" originated with the Royal Naval Air Service; and whether he will give the names of the officers mainly responsible for their conception and for bringing them, in the first place, to the notice of the Third Sea Lord, and through him to the Director of Naval Construction?

The Parliamentary Secretary to the Admiralty (Dr. Macnamara): There is no doubt that the idea of employing armoured cars for trench warfare occurred independently to several people, and all that the Admiralty can do is to state what appears in the Admiralty official records. According to these, the idea was suggested to officers of the Royal Naval Air Service by their experience of the naval armoured cars in Flanders in the early days of the war. After various experiments by the officers of the Royal Naval Air Service, my right hon. Friend (the late First Lord) instructed Mr. D'Eyncourt, the Director of Naval Construction, to undertake the design of a "tank" or landship, capable of carrying out certain definite performances.

The officers of the Air Department at the Admiralty primarily concerned were Commodore Sueter, Wing Commander W. Briggs, and Squadron Commander T. G. Hetherington. While the principal credit for the design of the "tanks" now being employed at the front rests with Mr. D'Eyncourt, the latter has mentioned the following gentlemen as rendering him valuable assistance:—

Mr. W. O. Tritton, Managing Director of Messrs. W. Foster and Company, Limited.

Lieutenant D. G. Wilson, R.N.A.S. (now Major Wilson, M.G.C.)

Mr. P. Dale Bussell, Contract Department, Admiralty.

Lieutenant A. G. Stern, R.N.A.S. (now Lt.-Col. Stern, M.G.C.)

Captain Symes, M.G.C.

Mr. F. Skeens, Acting Assistant Constructor.

[While assenting to the inclusion of the names of most of the people mentioned in this reply, one regrets to note that no mention is made of Mr. R. F. MacFie, late of the Armoured Car Section, who is recognised by many people as having originated the combination of the landships and the only mechanism which could drive them. It seems that the only way to settle this question satisfactorily is to hold a sworn inquiry into the whole affair. Some interesting evidence could be produced, and it might then be possible to discover who is really deserving of credit and who is not.—Ed.]

DEFECTIVE AEROPLANES.

Mr. H. A. Watt (by Private Notice) asked the Secretary of State for War whether complaints have been received of the machines provided for the use of a squadron of the Royal Flying Corps which is due to leave for the front this week; whether these machines are a British copy of a successful French design; whether they have been reported as inherently unstable and dangerous in landing; whether only two of these out of five arrived safely in a recent squadron flight from one aerodrome to another; and what steps he proposes to take in the matter?

Major Baird (representing the Air Board): The first trial of the aeroplane referred to in my hon. Friend's question gave rise to certain criticisms. It was, therefore, sent to the Expeditionary Force for further trial in comparison with French-built machines of the same type, and the report on it was favourable except for two minor matters which are being attended to. The reply to the second part of the question is in the affirmative. As regards the third part, I am informed that the machine is not inherently unstable, and not unduly difficult to land, though, no doubt, not a beginner's machine. Nothing is known of the incident referred to in the fourth part of the question. I may add that exactly the same type of machine is and has been for some time past constantly and successfully used against the enemy by the Royal Naval Air Service.

[It would be interesting if Mr. Watt would mention the name of these machines and indicate who made them in this country. There seem to be plenty of highly efficient British machines which could be contracted out, without making bad imitations of French machines.—Ed.]

THE AIR BOARD.

Lord Montagu of Beaulieu, speaking at Brockenhurst on Oct. 21st, said that the present position of the Air Board was far from satisfactory. It had no real powers, and was openly flouted by the Admiralty. How long was Lord Curzon going to tolerate this somewhat absurd position? Before long both the country and Parliament would demand that some more real powers should be given to the Board.

The recent raids on this country showed that our home defences had improved, but we must bear in mind that Germany was turning out a Zeppelin about once a fortnight, and it would be simply folly on our part if we did nothing more in the way of defence. He thought the Admiralty were very seriously to blame with regard to airship construction. While the German Fleet was an eyed fleet, we had a blind one, but he believed that at last the Admiralty were doing something to accelerate progress.

THE NAVY LEAGUE AND AERONAUTICS.

One is glad to see that the Navy League with its powerful organisation has not by any means given up its interest in aerial matters.

It will be remembered that before the war the Navy League did much to stir up interest in aircraft throughout the country, and even had the temerity to demand £1,000,000 for aeroplanes at a time when £10,000 sounded a big figure.

The League's Trafalgar Day Manifesto for 1916 includes its propaganda during the continuance of the war, and among the various excellent objects to be propagated one finds:—

"The Organisation of Public Opinion in support of the creation of an Imperial Air Policy and a responsible Air Minister following upon the war."

The League states that its programme of activity will be maintained with all resources at the disposal of the League during the period of the war, and one feels sure that much good work will be done during that period however extended it may be.

RATINGS AS PILOTS.

"Truth," of October 18th, says:—

It is about time that the Admiralty got rid of the silly prejudice which prevents a petty officer or man from being recognised as a flying officer. In the early days of naval aeronautics many ratings, from leading seamen upwards, took their tickets, and there are now scores of men from warrant rank downwards who are capable fliers. Yet an R.N.A.S. commission is denied to them, while hundreds of youngsters are entered and given their commissions even while under training. That is not all. Navy men are not even allowed to fly as officially recognised pilots, and this in spite of the fact that it costs only an extra 4s. a day when a warrant officer flies as against 8s. when a flight sub-lieutenant "goes up."

There is probably some kudos to be gained by some Member of Parliament who will call attention to this and other curiosities in the extra rates of pay prevalent in the R.N.A.S. An assistant paymaster graded as a trained observer is paid 5s. per day continuously so long as he is detailed to any ship or station for observation duties, no matter whether he flies or not, but a petty officer of precisely similar qualifications, subjected to the same training and tests, and detailed for the same work, is paid 2s. only on such days as he "goes up." The extra pay is clearly given for two things: as a reward for the qualification and as a return for the risk. In a blank week the A. P. will receive 35s., and the P.O. nothing, and in a full week 35s., against the man's 14s. Why should there be this difference where there is an obvious equality both of service and of risk?

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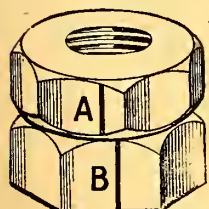
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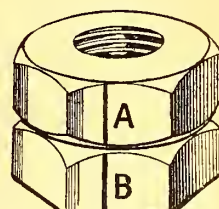


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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Oct. 17th, 1916.

ADMIRALTY, Oct. 14th.

R.N.A.S.—Temp. Proby. Flt. Sub-Lts. to be temp. Flt. Sub-Lts.:—G. B. Wardell-Yerburgh, Aug. 7th, 1915. H. J. Arnold, D.S.O., Aug. 27th, 1915. E. F. Beaumont, Sept. 22nd, 1915. A. J. H. MacColl, Oct. 17th, 1915. E. O'D. Cream, Oct. 24th, 1915. H. A. Pailthorpe, Nov. 8th, 1915. E. R. Fritchard, Nov. 22nd, 1915. V. R. Gibbs, Jan. 22nd, 1916. T. G. Culling and G. M. F. O'Brien, Jan. 29th. C. A. Maywood, Feb. 11th. C. R. H. Stewart, Feb. 16th. P. O. Gadbois, Feb. 29th. W. H. Strettell-Miller, March 18th. G. T. Bysshe, March 22nd. E. P. M. Davis, L. W. Ormerod, I. M. Fry, S. J. Fetherston, and W. E. C. B. C. Forsyth, April 3rd. F. P. L. Washington, April 7th. J. B. Daniell, April 9th. A. G. MacDonald, April 11th. E. D. Davis and B. A. Smart, April 15th. W. K. Denham, April 17th. F. H. Prime, May 1st. R. R. Thornely, May 5th. G. R. Halliday, May 7th. H. M. Ireland, May 9th. L. H. Rochford, May 14th. W. V. Simons, May 20th. S. D. Scott and W. M. Lusby, May 21st. T. R. Shearer, May 23rd. B. A. Millsom and D. FitzG. FitzGibbon, May 28th. A. M. FitzRandolph, June 3rd. C. S. Iron and P. H. Mackworth, June 25th. N. W. Frames, July 12th.

Oct. 16th.—Temp. Flt. Sub-Lt. to be temp. Flt. Lt.:—H. G. Brackley, Oct. 1st.

WAR OFFICE, Oct. 17th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—CENTRAL FLYING SCHOOL.—Instrs.—Temp. Lt. (temp. Capt.) J. C. Russell, R.E., a Flt. Comdr., July 1st. Sec. Lt. (temp. Capt.) S. G. Hodges, Wilts R., a Flt. Comdr., Aug. 1st.

Flying Officers.—Temp. Sec. Lt. J. S. Cooper, York and Lanc. R., and to be transfd. to Gen. List, Sept. 19th. Lt. W. Halliwell, T.F. Res.; Sec. Lt. D. S. Hall, Arg. and Suth'd Highrs., T.F., Sept. 22nd. Lt. H. D. E. Ralfe, Australian F.A., temp. Sec. Lt. W. C. Crawford, Machine Gun Corps, and to be transfd. to Gen. List, Sept. 23rd. Temp. Sec. Lt. J. T. Collier, R.A., and to be transfd. to Gen. List, Sept. Lt. L. S. Bowman, R. Lanc. R., T.F., Sept. 24th. Temp. Sec. Lt. C. A. Brewster-Joske, Gen. List, from a Flying Officer (Observer), with seny. from Feb. 27th. Sec. Lt. (on prob.) T. H. Butler, Bord. R., S.R., and to be secd., Sec. Lt. (temp. Lt.) C. L. Pickering, Ches. R., T.F., temp. Lt. A. V. Burlton, A.S.C., and to be transfd. to Gen. List, Sec. Lt. (temp. Lt.) J. A. Parkinson, R. Lanc. R., T.F., Lt. H. L. Kennedy, 70th Canadian Inf. Bn., Sec. Lt. H. C. Baker, S.R. (since decd.), Sec. Lt. C. E. S. Russell, S.R., Lt. C. A. S. Bean, Canadian Gen. List, Sec. Lt. F. H. Humphreys, S.R., Sec. Lt. G. Lea, S.R., Sept. 25th. Sec. Lt. A. R. E. Henley, R. Scots, T.F., Sept. 26th. Temp. Sec. Lt. A. D. S. Culling, Devon R., and to be transfd. to Gen. List, Sec. Lt. D. K. Sworder, S.R., temp. Sec. Lt. (on prob.) L. I. Barker, Gen. List, Sept. 27th. Lt. C. de P. D. Swain, Wessex (Howitzer) Brig., R.F.A., T.F., Sec. Lt. (on prob.) R. A. James, Middl'x R., S.R., and to be secd., temp. Sec. Lt. W. H. Irvine, Gen. List, Sept. 28th.

Balloon Officers.—Sec. Lt. (temp. Lt.) A. M. Van der Byl, H.A.C., T.F., Sept. 15th. Temp. Capt. A. J. Mann, A.S.C., and to be transfd. to Gen. List, temp. Lt. R. S. Lardner, Bedf. R., Sec. Lt. C. H. Gimmingham, Herts R., T.F., Sec. Lt. W. H. Chatham, North'n R., S.R., and to be secd., temp. Sec. Lt. W. J. H. Horrocks, Gord. Highrs., and to be transfd. to Gen. List, temp. Sec. Lt. (on prob.) V. J. Hammond, Gen. List, temp. Sec. Lt. (on prob.) S. Orchard, Gen. List, Sec. Lt. (on prob.) W. P. Bingham, S.R., temp. Sec. Lt. J. L. Greener, Gen. List, temp. Sec. Lt. F. J. K. Mason, Gen. List, temp. Sec. Lt. F. B. Stevens, Gen. List, Sept. Lt. (on prob.) F. H. Postlethwaite, S.R., Sept. 23rd.

Adjts.—Lt. W. B. Eryans, Norf. R., S.R., and to be secd., Sept. 25th. The appt. of Lt. (temp. Capt.) B. H. Bonham-Carter, 40th Pathans, Ind. Army, notified in "Gazette" of Sept. 28th, is cancelled.

Equipment Officer, 3rd Cl.—Sec. Lt. (on prob.) J. D. Coales, S.R., Sept. 1st.

MEMORANDUM.—1st Cl. Air Mechanic T. N. Gilbert, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with Mil. Wing of that Corps, Oct. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—H. J. Butler, R. M. Charley, T. T. Cumming, H. N. Stradling.

The appointment of Sec. Lt. E. S. Cohen, notified in "Gazette" of July 27th, is antedated to June 21st.

To be Sec. Lts. (on prob.):—W. H. G. Furnivall, W. L. Shaw, H. R. Williamson, J. F. B. Smith, H. Gray, J. H. Fletcher, A. Graham, G. K. Johnson, H. H. Leage, J. E. Terry, H. N. O'Donnell, Oct. 7th.

TERRITORIAL FORCE.—YEOMANRY.—MONTGOMERYSHIRE.—Sec. Lt. (temp. Lt.) T. F. Burrill is secd. for duty with the R.F.C., Sept. 29th.

3RD CO. OF LOND.—Sec. Lt. E. A. de Pass is granted the temp. rank of Lt. whilst empld. with the R.F.C., Sept. 1st.

2ND LOND. DIVL. CYCLIST CO.—Sec. Lt. W. J. Corbishley is granted the temp. rank of Lt. whilst empld. with the R.F.C., Sept. 1st.

R.F.A.—WELSH BRIG.—Sec. Lt. R. H. N. Lomax is secd. for duty with the R.F.C., Sept. 11th.

LOND. BRIG.—Sec. Lt. W. R. B. McBain is granted the temp. rank of Lt. whilst empld. with the R.F.C., Sept. 1st.

R.G.A.—S. MID. BRIG.—Sec. Lt. E. R. H. Pollak is granted the temp. rank of Lt. whilst empld. with the R.F.C., Sept. 1st.

E. RIDING.—Sec. Lt. W. W. Sawden is secd. for duty with the R.F.C., Oct. 4th.

N. SCOTTISH.—Sec. Lt. D. J. MacDonald is granted the temp. rank of Lt. whilst empld. with the R.F.C., Sept. 1st.

R.E.—DEVON FORTRESS ENG.—Sec. Lt. H. P. L. Higman is granted the temp. rank of Lt. whilst empld. with the R.F.C., Sept. 1st.

INFANTRY.—W. RID. R.—Sec. Lt. H. S. Holroyd is granted temp. rank of Lt. whilst serving with R.F.C., Sept. 1st.

L. N. LANC. R.—Sec. Lt. A. G. C. Dann is granted temp. rank of Lt. whilst serving with R.F.C., Sept. 1st.

HUNTINGDON CYCLIST BN.—Sec. Lt. W. S. Caster is granted temp. rank of Lt. whilst serving with the R.F.C., Sept. 1st.

* * *

From the "London Gazette" Supplement, Oct. 18th, 1916.

WAR OFFICE, Oct. 18th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers.—Temp. Sec. Lt. (on prob.) C. E. Mackay, Gen. List, Sept. 28th, 1916. Sept. 29th, 1916: Lt. K. R. G. Fenwick, R.H. Gds., and to remain secd.; Sec. Lt. H. J. Butler, Spec. Res.; temp. Sec. Lt. F. N. Insoll, Gen. List; Sec. Lt. A. F. Barker, Hamps. R., and to be secd. Sec. Lt. (temp. Lt.) G. F. Knight, Devon R., from a Flying Officer (Observer), with seniority from Apr. 29th, 1916. Sec. Lt. (temp. Lt.) G. L. Colomb, Lond. R., T.F. Sept. 30th, 1916: Sec. Lt. A. Gray, Arg. and Suth'd Highrs., T. F.; Sec. Lt. J. C. Smith, E. Rid. of York. Yeo., T.F.; Sec. Lt. T. Thomson, Arg. and Suth'd Highrs., T.F.; Sec. Lt. R. M. Charley, Spec. Res.; temp. Sec. Lt. F. W. Mitchell, Gen. List.

Flying Officers (Observers).—Sept. 29th, 1916: Lt. H. E. Paquin, 22nd Canadian Inf. Bn.; temp. Lt. R. S. S. Brown, High. L.I., and to be transfd. to Gen. List; Sec. Lt. G. Chetwynd Staplyton, Yorks. L.I., T.F.; Sec. Lt. F. E. S. Phillips, Devon. R., Spec. Res., and to be secd. Oct. 1st, 1916: temp. Sec. Lt. V. Bayley, L'pool R.; temp. Sec. Lt. H. E. Hervey, Gen. List.

Equipment Officers, 3rd Cl.—Temp. Sec. Lt. R. G. Meech, Gen. List, July 31st, 1916. Sec. Lt. W. E. Bousfield, Spec. Res., Aug. 4th, 1916. Sec. Lt. A. W. Thompson, Spec. Res., Aug. 7th, 1916. Aug. 8th, 1916: Sec. Lt. (on prob.) T. McC. Yarwood, Spec. Res.; temp. Sec. Lt. A. G. Cox, Gen. List. Temp. Sec. Lt. C. V. Thornton, Gen. List, Aug. 9th, 1916. Sec. Lt. C. S. Hickie, Spec. Res., Aug. 16th, 1916. Temp. Sec. Lt. H. P. Bramwell, Arg. and Suth'd Highrs., and to be transfd. to Gen. List, Aug. 21st, 1916. Temp. Capt. W. E. Smith, A.S.C., and to be transfd. to Gen. List, Aug. 24th, 1916. Sept. 18th, 1916: temp. Sec. Lt. (on prob.) W. J. R. Sheppard, Gen. List; temp. Sec. Lt. (on prob.) J. W. Maddock, Gen. List.

SCHOOL OF AERIAL GUNNERY.—Comdt. (graded as a Wing Comdr.).—Lt. (temp. Maj.) L. A. Strange, Dorset R., from Sqdn. Comdr., and to be temp. Lt.-Col. whilst so empld., Sept. 13th, 1916.

Chief Instr. (graded as a Park Comdr.).—Lt. (temp. Capt.) H. E. Chaney, Lan. Fus., from an Equipment Officer, and to be temp. Maj. whilst so empld., Sept. 13th, 1916.

Instrs. (graded as Equipment Officers, 1st Cl.).—From Asst. Equipment Officers, and to be temp. Capt. whilst so empld., Sept. 13th, 1916: temp. Sec. Lt. (temp. Lt.) F. G. Wilson, Gen. List; temp. Sec. Lt. S. W. Cooper, Gen. List.

Staff Officer, 2nd Cl. (graded for purposes of pay as a Brig. Maj.).—Capt. K. B. Harbord, R.A., from a Flying Officer, Sept. 13th, 1916.

Adjts.—Temp. Qmr. and Hon. Lt. H. R. Howarth, Gen. List, and to be temp. Capt. whilst so empld., Sept. 13th, 1916.

MEMORANDA.—Acting Sgt.-Maj. John Patrick Augell, from R.F.C., to be Sec. Lt. for duty with R.F.C., Oct. 19th, 1916.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.: Pte. Edgar L. Ravenscroft, from A.S.C., Oct. 2nd, 1916. Frank D. Reynolds, Oct. 7th, 1916.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) J. I. Jones resigns his commn., Oct. 19th, 1916.

TERRITORIAL FORCE.—INFANTRY.—E. LANC. R.—Sec. Lt. C. Parkinson is secd. for duty with the R.F.C., Sept. 22nd.

WELSH R.—Sec. Lt. P. L. Stephens is secd. for duty with R.F.C., Sept. 22nd.

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MIDD'X. R.—Sec. Lt. W. L. Wells is secd. for duty with the R.F.C., Sept. 22nd, 1916.

LOND. R.—Sec. Lt. (temp. Lt.) G. S. Buck is secd. for duty with the R.F.C., Sept. 21st, 1916.

* * *

From the "London Gazette" Supplement, Oct. 19th, 1916.

WAR OFFICE, Oct. 19th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Sqdn. Comdr.—Capt. L. Jenkins, Dorset, R.G.A., T.F., from a Flt. Comdr., and to be temp. Maj. whilst so empld., Sept. 20th.

Flying Officers.—Sec. Lt. R. A. Denne, Wilts R., and to be secd., July 30th. Sec. Lt. (on prob.) J. Smyth, Spec. Res., Sept. 22nd. Temp. Lt. F. A. George, 16th North'd Fus., and to be transf'd. to Gen. List, Sec. Lt. (temp. Lt.) T. F. Burrill, Montgomeryshire Yeo., T.F., temp. Lt. L. S. Arbutnot, A.S.C., and to be transf'd. to Gen. List, temp. Sec. Lt. (on prob.) R. B. Corfield, Gen. List, temp. Sec. Lt. (on prob.) E. V. Gibson, Gen. List, temp. Sec. Lt. (on prob.) A. H. Hodgson, Gen. List, Sec. Lt. A. H. Whistler, Dorset R., and to be secd., Sept. 29th. Temp. Capt. C. N. Lowe, A.S.C., and to be transf'd. to Gen. List, Sec. Lt. (temp. Lt.) A. H. C. Bruce, R.A., and to be secd., temp. Sec. Lt. C. S. Fulton, R. Sc. Fus., and to be transf'd. to Gen. List, temp. Sec. Lt. A. W. Wood, W. York R., and to be transf'd. to Gen. List, Sept. 30th.

Flying Officers (Observers).—Sec. Lt. E. Y. FitzGerald, Herts Yeo., T.F., July 1st. Lt. H. D. Williams, Auckland Mtd. Rif., N. Zealand Contingent, temp. Sec. Lt. G. C. Heseltine, E. York R., and to be transf'd. to Gen. List, temp. Sec. Lt. F. E. Hillebrandt, Suff. R., and to be transf'd. to Gen. List, temp. Sec. Lt. (on prob.) H. E. Judge, Gen. List, July 15th. Sec. Lt. C. D. Thompson, H.A.C., T.F., July 24th. Temp. Lt. S. F. Lydon, A.S.C., and to be transf'd. to Gen. List, Sec. Lt. N. Clark, E. Lan. Brig., R.F.A., T.F., Sec. Lt. E. T. H. Ellis, S. Mid. Divl. Sigl. Co., R.E., T.F., temp. Sec. Lt. (on prob.) F. G. Ibbett, Gen. List, Sec. Lt. E. T. Shand, Otago Mtd. Rif., N. Zealand Contingent, Aug. 1st. Temp. Capt. J. Leacroft, A.S.C., and to be transf'd. to Gen. List, Lt. A. B. Jarvis, Middx. R., T.F., Sec. Lt. S. S. Hume, 1st Co. of Lond. Yeo., T.F., Sec. Lt. A. I. Campbell-Robertson, 18th Hrs., and to be secd., August 15th. Lt. A. G. Adams, 5th Bn. (Victoria), Australian Imperial Force, Lt. D. W. Rutherford, 5th Regt. (Queensland) Australian Light Horse, temp. Sec. Lt. J. F. Alcock, Bedf. R., and to be transf'd. to Gen. List, Aug. 25th. Temp. Capt. (temp. Maj.) H. R. Coningsby, Middx. R., Sec. Lt. (temp. Capt.) J. Longton, A.S.C., and to be secd., temp. Sec. Lt. H. G. G. Joynson, R.A., and to be transf'd. to Gen. List, temp. Sec. Lt. J. C. Watson, R. Fus., and to be transf'd. to Gen. List, temp. Sec. Lt. E. R. Cottier, R.A., and to be transf'd. to Gen. List, Sept. 1st. Sec. Lt. D. N. Thompson, Glasgow Yeo., T.F., Sept. 3rd. Temp. Sec. Lt. F. Libby, Gen. List, Sept. 26th. Equip. Officers, 3rd Cl.—Sec. Lt. H. F. Groves, North'd Fus., T.F., Sept. 2nd. Temp. Sec. Lt. (on prob.) V. W. Allen, Gen. List, temp. Sec. Lt. (on prob.) J. H. Dale, Gen. List, Sept. 11th. Temp. Sec. Lt. A. C. Day, Gen. List, Sept. 29th. Sec. Lt. W. J. King, N. Staff. R., and to be secd., Sept. 30th.

MEMORANDA.—Act. Sgt.-Maj. J. Baxter, from R.F.C., to be Sec. Lt. for duty with R.F.C., Oct. 12th.

Temp. Sec. Lts. to be temp. Lts. whilst serving with R.F.C.:—H. L. Lascelles, A. Ellison, H. B. Denton, S. O. Barnsdale, R. F. Wills, A. M. Thom, R. B. Fricker, S. G. Kingsley, R. P. Willock, R. F. Sinclair, L. E. Eeman, H. Hamer, C. B. Cooke, W. J. Y. Guilfoyle, H. H. James, Sept. 1st. Cdt. J. B. Crabb to be temp. Sec. Lt. (on prob.), for duty with R.F.C., Oct. 7th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. to be Lts.:—(Temp. Capt.) V. A. H. Robeson, (temp. Capt.) J. P. C. Sewell, (temp. Capt.) C. C. Miles, J. L. Williams, (temp. Capt.) J. Latta, (temp. Capt.) R. W. Nichol, W. C. Mortimer-Phelan, (temp. Capt.) H. G. Salmond, (temp. Capt.) M. Le Blanc-Smith, (temp. Capt.) D. Joy, (temp. Capt.) J. A. Crook, (temp. Capt.) C. G. Tucker, (temp. Capt.) F. J. H. Thayer, (temp. Maj.) H. Lee, J. S. Castle, Sept. 1st.

To be Sec. Lts.:—C. G. Nevatt, S. B. Browning, R. W. Anderson, Aug. 17th. W. R. Cannon, Aug. 27th.

The following Sec. Lts. (on prob.) are confirmed in their rank:—I. Smyth, W. B. Kellogg, A. Edwards.

To be Sec. Lts. (on prob.):—C. Deards, Sept. 9th. J. Ferguson, Oct. 9th.

TERRITORIAL FORCE.—HONOURABLE ARTILLERY COMPANY.—Sec. Lt. (temp. Lt.) A. M. Vander-Byl is secd. for duty with the R.F.C., Sept. 15th.

INFANTRY.—ROYAL SCOTS.—Sec. Lt. A. R. E. Henley is secd. for duty with the R.F.C., Sept. 26th.

R. LANCASTER R.—Sec. Lt. L. S. Bowman is secd. for duty with the R.F.C., Sept. 24th. Sec. Lt. (temp. Lt.) J. A. Parkinson is secd. for duty with the R.F.C., Sept. 25th.

MIDD'X R.—Sec. Lt. (temp. Lt.) H. A. R. Boustead is secd. for duty with the R.F.C., Sept. 20th. Lt. A. B. Jarvis is secd. for duty with the R.F.C., Aug. 15th.

MANCHESTER R.—Lt. (temp. Capt.) C. S. S. Higham is secd. for duty with the R.F.C., Sept. 18th.

HERTS R.—Sec. Lt. C. H. Gimingham is secd. for duty with the R.F.C., Sept. 23rd.

CHESHIRE REGT.—Sec. Lt. (temp. Capt.) C. L. Pickering (Prov. Bn.) is now secd. for duty with the R.F.C., Sept. 25th.

SCOTTISH BORDERERS.—Sec. Lt. (temp. Lt.) H. W. McGowan is secd. for duty with the R.F.C., Sept. 25th.

YORKS L.I.—Sec. Lt. G. C. Stapylton is secd. for duty with the R.F.C., Sept. 29th.

ARG. AND SUTH'D HIGHRS.—Sec. Lt. D. S. Hall is secd. for duty with the R.F.C., Sept. 22nd.

LOND. R.—Sec. Lt. A. C. Woodman is secd. for duty with the R.F.C., Sept. 23rd.

* * *

A supplement to the "London Gazette" of Oct. 19th contains a dispatch from Lt.-Gen. Sir Percy Lake, Commanding the Indian Expeditionary Force "D," addressed to the Chief of the General Staff in India, and dated from the General Headquarters, Basrah, Aug. 24th, in which he submits a detailed list of officers, warrant officers, non-commissioned officers, and men whom he desired to bring to special notice for their meritorious services in the course of the operations in Mesopotamia from Jan. 19th to April 30th, the period including the efforts in the further attempt to relieve Kut.

The following mentions refer to officers' and N.C.Os. of the R.F.C.:—

STAFF AND HEADQUARTERS.—Broke-Smith, Capt. (temp. Maj.) P. W. L., R.F.C.

ROYAL FLYING CORPS.—Cuff, Lt. R. E., N. Lanc. R., Spec. Res.; Dickinson, Lt. T. M., 16th Cav.; Thomson-Glover, Capt. J. W., 35th Sikhs; Massy, Bt. Maj. S. D., D.S.O., 29th Punjabis; McCrindle, Sec. Lt. I. R., Spec. Res.; Orton, Lt. (temp. Capt.) J. O. C., Norfolk R.; Petre, Capt. H., Australian F.C.; Wills, Sec. Lt. (temp. Capt.) W. R., Ind. Army Res. of Off.

Mackinlay, No. 43 Flt. Sgt. G. J. W.; Tomlinson, No. 4474 Flt. Sgt. R. J.; Webb, No. 4477 Flt. Sgt. A.

* * *

The Government of India has received from Lt.-Gen. Sir Percy Lake the name of the following officer recommended by Maj.-Gen. Townshend for distinguished service during the defence of Kut-el-Amara:—

R.F.C.—Winfield Smith, Flt. Comdr. S. C., Capt. E. Surr. R., Spec. Res.

* * *

The King has approved of the following honour for distinguished service in the field, with effect from June 3rd inclusive:—

DISTINGUISHED SERVICE ORDER.

Capt. and Bt. Maj. HUGH LAMBERT REILLY, Punjabis and R.F.C.

* * *

From the "London Gazette," Oct. 20th, 1916.

WAR OFFICE, Oct. 20th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdrs.—From Flying Officers, and to be temp. Capt. whilst so empld.:—Temp. Lt. C. E. I. C. Anne, Gen. List, Aug. 6th. Temp. Sec. Lt. N. W. Webb, Gen. List, Oct. 4th. Temp. Lt. J. R. Philpott, Oct. 7th.

Flying Officers.—Sec. Lt. (temp. Capt.) H. C. Stroud, Northumbrian R.E., T.F., Sec. Lt. L. R. Kerridge, Spec. Res., Sept. 22nd. Sec. Lt. A. Edwards, Spec. Res., Oct. 1st. Sec. Lt. (temp. Lt.) H. G. Amis, York. R., T.F.; temp. Sec. Lt. A. G. Cardwell, Gen. List; temp. Sec. Lt. L. F. Jones, Gen. List, Oct. 2nd.

Equip. Officers, 3rd Cl.—Sec. Lt. J. McCrae, Sea. Highrs., Sept. 1st. Sec. Lts., Spec. Res.:—R. W. Anderson, S. B. Browning, W. K. Cannon, C. G. Nevatt, F. W. Beard, C. B. Willcocks, Sept. 18th. Temp. Sec. Lt. H. F. Bradley, Gen. List, from a Flying Officer, Oct. 4th.

GENERAL LIST.—Cdts. to be temp. Sec. Lts. (on prob.) for duty with R.F.C., Sept. 26th:—G. E. Brookes, J. K. Chatham, G. I. Fry, E. L. Humphreys, B. F. Parsons, E. R. Payne, N. V. Spear, G. S. Wood, A. H. Waterman, P. W. Wilcox, F. V. Way, C. P. Beadon, P. S. Bell, J. C. B. Brown, P. R. Cann, T. E. Carley, W. A. Clark, R. L. Curtis, P. C. Felts, E. A. R. Fowles, E. S. Guy, H. V. Headland, A. J. P. Hyth, A. Jackson, R. H. Latham, A. W. Little, H. P. Ledger, D. T. Leyshon, G. B. Mason, P. L. McGavin, V. L. Monsell, L. B. Moor, H. Morley, L. F. Duval, P. Kent, J. A. Pattern, A. R. Penny, K. W. Bransby, H. Briggs, T. W. Calvert, W. Casson, J. Frost, J. Handley, S. Hewett, E. P. Holloway, H. Horrocks, W. Hunt, N. H. Lahaye, H. P. Lale, G. S. Lee, P. I. Lewis, A. F. Sheppard, D. A. Strutt, F. Sumpter, F. Thompson, S. Thompson, S. S. Turnbull, J. R. Waller, J. L. Walton, A. E. Wear, C. L. Whitburn, F. C. Wild, R. Wilson, T. A. Langford-Sainsbury, H. A. Payne, J. H. Walker, A. H. Craig, C. A. Farquharson, M. B. Frew, J. G. Blane, D. S. Gray, N. V. Harrison, J. Henry, J. Johnstone, P. E. Kerr, T. H. MacDonald, T. MacMillan, N. McLeod, N. MacMillan, F. W. Maclean, A. R. Martin, W. C. McMurray, W. Turnbull, P. R. Adams, C. S. Atkinson, F. F. Babbage, P. H. Baker, T. H. Bowen, S. R. Burton, A. Critchley, R. Dutton, F. Fowler, R. Grant, B. A. Gunner, J. E. B. Hesketh, T. J. Hudson, L. M. Hughes, C. A. Hyde, S. Leith, W. Moulding, N. R. Muir, J. L. Murray, H. F. Nicholls, D. L. Nutt,

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

L. A. Rivers, P. Robinson, B. Strachan, V. S. Taylor, S. Thompson, J. Toulmin, J. A. Westerman, L. A. Weston, W. Allan, F. V. Bryant, F. N. Clark, W. T. Edwards, F. L. Garner, E. R. Haines, J. Hancock, O. C. Pearson, L. F. Clark, B. E. Carter, F. Doherty, J. G. H. Frew, D. P. Glazer, A. Hartley, G. S. King, C. W. Lewis, R. F. Mullins, A. G. Platt, D. J. Reason, E. G. Roberts, T. Robinson, B. F. Sandy, S. E. M. Simpson, P. Wilson, R. D. Boyd, R. de R. Brett, H. P. Connar, W. Dawson, J. A. French, T. M. McFerran, M. J. McGarry, J. J. Malone, E. M. Meredith, E. T. Molyneux, T. M. O'Neill, J. J. Tivenan, D. P. Wilson, S. Pickford.

MEMORANDA.—To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Air Mech. Staff-Sgt. A. W. Barnett, from A.S.C.; Pte. S. H. Child, from A.S.C.; Spr. A. Smellie, from Lond. Elect. Engrs., T.F.; Cdt. S. R. Winkworth, Oct. 7th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The undermentioned to be Sec. Lts. (on prob.):—J. Paradise, Sept. 10th. C. E. Bagram, Oct. 7th.

From the "London Gazette" Supplement, Oct. 20th, 1916.

WAR OFFICE, Oct. 20th.

The King has been graciously pleased to approve of the appointment of the under-mentioned Officers to be Companions of the Distinguished Service Order, in recognition of their gallantry and devotion to duty in the Field:—

Capt. WILLIAM DOUGLAS STOCK SANDAY, M.C., R.F.C.

For conspicuous gallantry and skill. He has led over 35 patrols with great gallantry. On one occasion a machine of his formation was attacked, but he charged and brought down the enemy machine in flames. He has destroyed at least four enemy machines.

Lt. (temp. Capt.) ALAN MACHIN WILKINSON, Hamps. R. and R.F.C.

For conspicuous gallantry and skill. He has shown great dash in attacking enemy machines, and, up to the end of August, he had accounted for five. On one occasion while fighting a hostile machine he was attacked from behind, but out-maneuvred the enemy and shot him down. Finally he got back, his machine much damaged by machine-gun fire.

The King has been pleased to confer the Military Cross on the following officers in recognition of their gallantry and devotion to duty in the Field:—

Lt. (temp. Capt.) LESLIE PEECH AIZLEWOOD, York and Lanc. R. and R.F.C.

For conspicuous gallantry and skill. Seeing five hostile machines, he manœuvred to get between them and their lines; then, diving on one of them, he reserved his fire till he was only twenty yards off. The hostile machine fell out of control, but he was so close to it that he collided with it, breaking his propeller and damaging his machine. Though it was barely controllable, he managed to get back to our lines.

Sec. Lt. (temp. Capt.) JOHN OLIVER ANDREWS, R. Scots and R.F.C.

For conspicuous gallantry and skill. He is a fine leader of offensive patrols, and has himself shot down four enemy machines. On one occasion he got within 25 yards of an enemy machine under heavy fire and brought it down a wreck.

Sec. Lt. (temp. Lt.) ALAN DUNCAN BELL-IRVING, Gord. Highrs., Spec. Res., and R.F.C.

For gallantry and skill in attacking a hostile balloon at

1,000 feet under heavy fire and bringing it down in flames. On a previous occasion he brought down a hostile machine.

Temp. Sec. Lt. (temp. Capt.) KEITH RIDDELL BINNING, Gen. List and R.F.C.

For conspicuous gallantry and skill, notably when he made two contact patrol flights over the enemy's trenches at a height of under 1,000 feet. His machine was repeatedly hit by machine-gun and rifle fire, but he rendered exact reports of the position of our own and the enemy's troops. On another occasion he did similar fine work.

Sec. Lt. ALAN JOHN BOTT, R.G.A., Spec. Res. (attd. R.F.C.).

For conspicuous gallantry and skill. As observer he has been in many fights and furnished many good reports. On one occasion, when his pilot was gliding back to our lines after his engine has been hit and stopped, he drove off an attacking aeroplane and put out with his hands a fire started by anti-aircraft guns. On another occasion, after driving down one hostile aeroplane, he fired at another, which dived and collided with a third. This last one fell vertically.

Sec. Lt. WALTER HORACE CARLYLE BUNTINE, Notts and Derby R. and R.F.C.

For conspicuous gallantry and skill. As escort to a bombing raid he attacked several hostile machines, one of which fell to the ground nose first. Later he was attacked by three enemy machines, his own machine being damaged and himself severely wounded. With great skill he managed to land in our lines, though most of his propeller was shot away and his machine otherwise much damaged.

Sec. Lt. CLIFFORD WESTLY BUSK, Suff. R. and R.F.C.

For conspicuous gallantry and skill. He has taken part in many reconnaissances and fights, and on one occasion shot down an enemy aeroplane. On another occasion, when his pilot's control wires were cut and the machine went into a spin, he helped to restore stability by leaning far out on the upper side, and remained in this position till the machine got home.

Sec. Lt. (temp. Capt.) JAMES LANDER CHALMERS, R.F.C., Spec. Res.

For conspicuous gallantry and skill. He has done much fine counter-battery work, often flying very low under heavy fire from the ground. On one occasion one of our shells broke the main spar of his machine. On another in one flight he dealt effectively with four enemy batteries.

Temp. Sec. Lt. LESLIE FREDERICK FORRES, Gen. List and R.F.C.

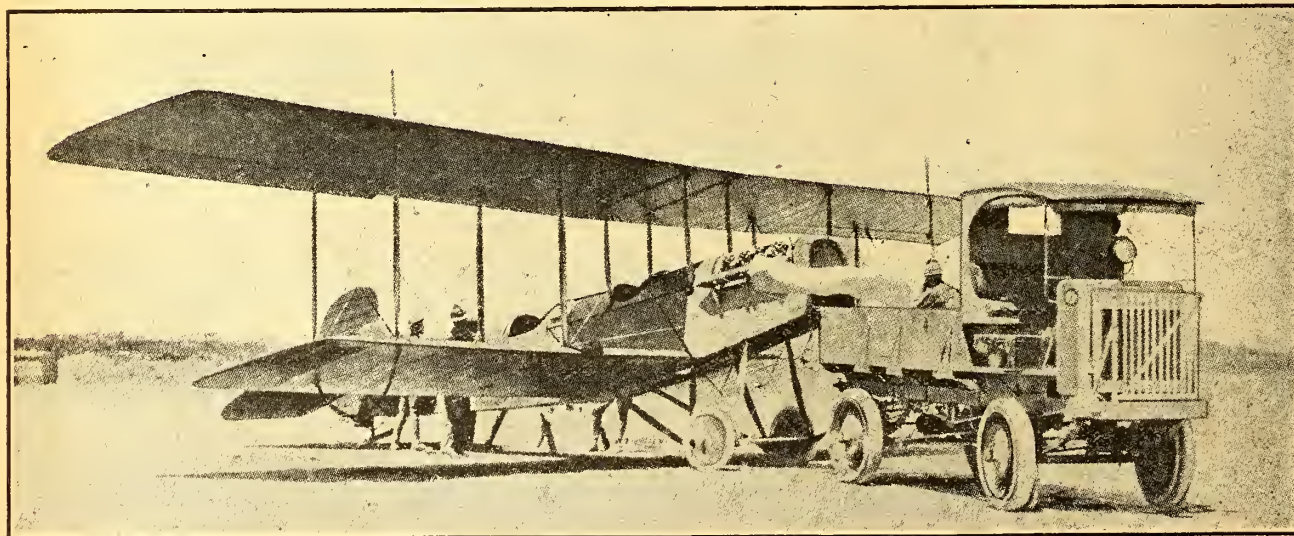
For conspicuous gallantry and ability in attacking hostile machines and bombing railway lines, especially on one occasion, when he descended to 350 ft. in order to accomplish his object.

Sec. Lt. EUAN JAMES LESLIE WARREN GILCHRIST, Lrs. and R.F.C.

For conspicuous gallantry and skill when he attacked a hostile balloon and brought it down in flames, although under heavy fire and attacked by six hostile machines.

Sec. Lt. (temp. Capt.) IAN HENRY DAVID HENDERSON, Arg. and Suth'd Highrs.

He drove down a machine out of control, and two days later dispersed six enemy machines which were attacking his formation. A few days later again he brought down an enemy biplane, the observer being apparently killed. A week after this he attacked and drove down another machine which had



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wounded his leader. He has also carried out several excellent contact patrols and attacked retiring artillery and a kite balloon.

Sec. Lt. GEOFFREY TERENCE ROLAND HILL, R.F.C., Spec. Res.

For conspicuous gallantry and skill. He attacked an enemy kite balloon under very difficult circumstances, and continued firing until he was within 20 ft. of it. He was then only 1,000 ft. from the ground and under heavy fire from anti-aircraft and machine-guns, but on looking round he saw the burning wreckage of the balloon on the ground.

Capt. HENRY JOHN FRANCIS HUNTER, Rif. Brig. and R.F.C.

For conspicuous gallantry and skill. He has done fine work for the artillery, and has accounted for many enemy guns. On one occasion, when a heavy storm drove all other machines back to their aerodromes, and the enemy guns took the opportunity to become active, he remained up and did fine work.

Sec. Lt. (temp. Capt.) CHARLES CLEAVER MILES, R.F.C., Spec. Res.

For conspicuous gallantry and skill. He has shown great dash in contact patrol work. On one occasion he reconnoitred an enemy trench at 500 ft. altitude, under heavy fire, which severely damaged his machine. Five days later, while working at 600 ft., he was severely wounded.

Temp. Capt. KENNETH NOBLE PEARSON, Gen. List and R.F.C.

With one other pilot he attacked 10 hostile aeroplanes. The other pilot had his controls cut and had to return, but Capt. Pearson fought on till all the enemy aeroplanes were dispersed. On another occasion he bombed trains from a low altitude. He has done other fine work.

Sec. Lt. FENTON ELLIS STANLEY PHILLIPS, Devon R., Spec. Res., and R.F.C.

For conspicuous gallantry and skill. He has done fine contact patrol work. On one occasion he came down to a low altitude while making a report, and his machine was much damaged by rifle and machine-gun fire, but he carried on and successfully put our artillery on to the enemy, who were massing for a counter-attack.

Temp. Lt. JOHN REGINALD PHILPOTT, Gen. List and R.F.C.

For conspicuous gallantry and skill in descending to about 300 feet, under heavy fire of all descriptions, in order to bomb a train. Finding that Capt. Tyson had wrecked the train, he dropped his bombs on a station and then assisted him to beat off hostile machines. He then, with Capt. Tyson, attacked a machine which was endeavouring to leave the ground. He has previously displayed great gallantry.

Temp. Lt. DAVID HARDEN SCOTT, Army Cyclist C. and R.F.C.

For conspicuous gallantry and skill. With Sec. Lt. Turk as pilot, he attacked seven hostile machines flying in formation, and brought down one as a wreck.

Sec. Lt. BERNARD VALENTINE SEYMOUR SMITH, R. War. R. and R.F.C.

For conspicuous gallantry and determination on several occasions when dropping bombs from a low altitude on points behind the enemy's lines.

Sec. Lt. HERBERT HENRY TURK, R.F.C., Spec. Res.

With Lt. Scott as observer, he attacked seven hostile machines flying in formation. One was brought down as a wreck. When turning to meet another machine his rudder controls were shot away, and his machine got into a spinning nose-dive. After falling 5,000 ft. he partially regained control, and, though his machine kept on turning, he managed to land safely. The machine was badly damaged; but, thanks to his skill, neither he nor his observer was hurt.

Temp. Capt. ERIC JAMES TYSON, Gen. List and R.F.C.

For conspicuous gallantry and skill during bombing raids. Descending to about 300 feet under heavy fire of all descriptions, he succeeded in wrecking a train. Whilst doing this he was attacked by other hostile machines, which he beat off with the assistance of Lt. Philpott, in another machine. Although wounded and with engine severely damaged he attacked with Lt. Philpott a group of men who were endeavouring to start a hostile machine, and scattered them in all directions. His machine was riddled with bullets.

SOUTH AFRICAN CONTINGENT.

Temp. Capt. (Flt. Comdr.) KENNETH REID VAN DER SPUY, R.F.C.

For conspicuous gallantry and skill. He flew for 4½ hours under dangerous climatic conditions, and brought back information of great value.

The following officers have been awarded a Bar to their Military Cross for subsequent acts of conspicuous gallantry:—

Sec. Lt. SIDNEY EDWARD COWAN, M.C., R.F.C., Spec. Res.

He has done fine work in aerial combats, and has shot down four enemy machines. (The Military Cross was awarded in the "London Gazette" dated May 31st, 1916.)

Capt. ALFRED GARNET MOORE, M.C., Manch. R., Spec. Res., and R.F.C.

While fighting he had several wires shot away and his main spar damaged. His machine went into a spinning nose-dive.

Nevertheless he finally managed to get some sort of control, and landed safely in an aerodrome. (The Military Cross was awarded in the "London Gazette" dated June 3rd, 1916.)

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From the "London Gazette" Supplement, Oct. 21st, 1916.

WAR OFFICE, Oct. 21st.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flight Comdr.—Lt. P. C. Sherran, 40th (Res.) Can. Inf. Bn., from a Flying Officer, and to be temp. Capt. whilst so empld., Oct. 6th.

Flying Officers.—Sec. Lt. (temp. Lt.) H. A. R. Boustead, Midd'x R., T.F.; Sec. Lt. H. J. Brewster, Midd'x R., and to be sec'd.; Sec. Lt. W. B. Kellogg, Spec. Res., Sept. 29th. Sec. Lt. C. L. Bullock, Rif. Brig., Spec. Res., from a Flying Officer (Observer), with seny. from March 1st; Capt. R. Oxspring, Yorks. L.I., Spec. Res., from a Flying Officer (Observer), with seny. from May 31st; Lt. E. J. Y. Grevelink, W. Rid. R., and to be sec'd., Sept. 30th. Temp. Sec. Lt. M. W. Dickens, Gen. List, Oct. 2nd. Capt. J. E. Mackay, 95th Canadian Inf. Bn.; temp. Sec. Lt. A. A. Patterson, Bord. R., and to be transd. to the Gen. List; Sec. Lt. R. H. Lemon, R. W. Surr. R., T.F., Oct. 4th.

Flying Officer (Observer).—The initials of temp. Sec. Lt. J. B. R. Langley, Gen. List, are as now described, and not as in "Gazette" of Sept. 22nd.

MEMORANDA.—Lt. W. Halliwell, from T.F. Res., Gen. List, to be temp. Lt. on Gen. List for duty with R.F.C., Sept. 22nd.

Lt. J. H. Cock, from New Zealand Expeditionary Force, to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Sept. 25th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) are confirmed in their rank:—H. S. Lees-Smith, H. Whitehead, A. E. Squire, T. Woodman.

To be Sec. Lts. (on prob.):—F. C. R. Johnson, Sept. 7th. C. C. Cruttenden, Oct. 7th.

R.G.A.—Sec. Lt. F. L. W., Viscount Combermere, from R.F.C. (Mil. Wing), to be Sec. Lt. (on prob.), Oct. 22nd.

TERRITORIAL FORCE.—INFANTRY.—R. W. Surr. R.—Sec. Lt. R. H. Lemon is sec'd. for duty with R.F.C., Oct. 4th.

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From the "London Gazette" Supplement, Oct. 23rd, 1916.

WAR OFFICE, Oct. 23rd.

REGULAR FORCES.—W.Os., N.C.Os., and men to be temp. Sec. Lts. (on prob.):—

MEMORANDA.—For duty with R.F.C.:—Petty Officer A. G. Tremain, from R.N.A.S., Sept. 8th. Pte. C. P. R. Holdcroft, from Hd.-Qrs. Staff, Can. Div., Sept. 10th. Pte. A. N. Martyn, from Lond. R. (T.F.), Sept. 11th. Cpl. W. J. Gray, from Can. Corps, Cav. Regt., Sept. 12th. Staff Sgt.-Maj. A. H. Cabeldu, from A.S.C.; L.-Sgt. H. B. Mann, from 10th R. Fus.; Gnr. J. Michie, from M.G.C.; Gnr. G. Maddock, from R. Can. H.A.; Pte. J. E. Le Gallais, from Can. A.S.C.; Pte. H. R. Hare, from Can. A.S.C.; Pte. P. L. Goudie, from Can. A.S.C.; Pte. G. H. Glendenning, from M.G.C., Sept. 15th. Cpl. A. W. Clarke, from R.E.; Cpl. C. T. Keble, from R.F.C.; 1st Cl. Air Mech. J. Watson, from R.F.C.; 1st Cl. Air Mech. C. H. Mendham, from R.F.C.; 2nd Cl. Air Mech. W. W. Fitzgerald, from R.F.C., Sept. 19th. Actg. Sgt. H. C. Barr, from Can. A.S.C.; Pte. R. Davis, from Can. Corps, Cav. Regt., Sept. 21st. Pte. N. M. H. Verham, from A.S.C., Sept. 22nd. Actg. Cpl. C. St. C. Acheson, from Can. A.S.C.; 2nd Cl. Air Mech. J. G. Beckham, from R.F.C.; Pte. V. C. Manuel from Can. A.S.C., Sept. 24th.

R.F.C.—ESTABLISHMENTS.—Flying Officers.—Sec. Lt. (temp. Lt.) E. C. Lansdale, W. Lan. A.S.C., T.F.; Sec. Lt. (on prob.) A. R. M. Scrase-Dickens, K.R. Rif. C., Spec. Res., and to be sec'd., Sept. 18th. Sec. Lt. W. W. Sawden, E. Rid. R.G.A., T.F., Sec. Lt. F. R. Hudson, Spec. Res., Oct. 4th. Temp. Sec. Lt. R. L. Dingley, 14th Worc. R., and to be transd. to Gen. List, Oct. 7th.

MEMORANDA.—To be temp. Sec. Lts. for duty with R.F.C.:—Co. Sgt.-Maj. J. A. Payne, Regtl. Sgt.-Maj. F. H. Hawksford, Sept. 10th.

To be temp. Sec. Lts. (on prob.):—Pte. G. K. Cathles, from Lond. R., T.F., for duty with R.F.C., Sept. 9th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Surname of Sec. Lt. (on prob.) J. D. Coales is as now described, and not as in the "Gazette" of Sept. 6th.

Following Sec. Lts. (on prob.) are confirmed in their rank:—J. D. Coales, C. Kennard, J. J. Bartlett, C. W. Barnsley, W. F. J. Matthews, H. I. Allen, F. H. O'Beirne, A. L. Challis, E. M. Leete, F. R. Hudson, J. D. Campion to be Sec. Lt., Sept. 9th. To be Sec. Lts. (on prob.):—F. Ryder, J. Page, J. Farquharson, W. T. Davis, H. Hoad, Aug. 24th. G. Barfoot-Saunt, Aug. 27th. E. D. C. Herne, Oct. 1st. S. C. Foster, E. B. Denison, R. R. Riggs, W. Wells, J. C. Noble, J. H. Muir, D. W. McGregor, C. Knowles, R. C. Steele, Oct. 6th.

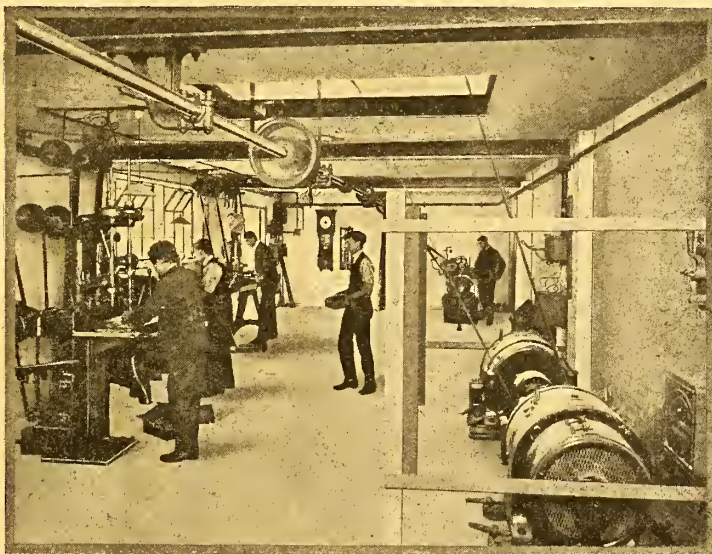
TERRITORIAL FORCE.—YEOMANRY.—1ST LONDON DIVL. CYCLIST Co.—Sec. Lt. (temp. Lt.) G. F. W. Brett to be sec'd. for duty with the R.F.C., Oct. 19th.

R.G.A.—N. SCOTTISH.—Sec. Lt. J. J. Little is sec'd. for duty with the Reg. R.G.A., Aug. 14th.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

TYNEMOUTH.—Sec. Lt. (temp. Lt.) D. Stewart is secd. for duty with the R.F.C., July 30th.

INFANTRY.—BEDFORD, R.—Lt. R. M. Plummer is secd. for duty with R.F.C., Aug. 28th.

LOND. R.—Lt. L. D. A. Dircks is secd. for duty with R.F.C., Aug. 28th. Sec. Lt. J. H. Rutherford is granted the temp. rank of Lt. whilst serving with the R.F.C., Aug. 1st.

THE COURT CIRCULAR.

BUCKINGHAM PALACE, Oct. 21st.

The following officers had the honour of being received by the King, when His Majesty invested them with the Insignia of Companions of the Orders into which they have been admitted:—

The Distinguished Service Order.—Capt. MALCOLM BELL-IRVING, R.F.C. Capt. WILLIAM SANDAY, R.F.C., and Sec. Lt. WULSTAN TEMPEST, R.F.C.

The King then conferred decorations as follows:—The Distinguished Service Cross.—Flt. Comdr. VIVIAN BLACKBURN, R.N.A.S., Flt. Comdr. EDWIN DUNNING, R.N.A.S., Flt. Lt. HENRY THOROLD, R.N.A.S.

The Military Cross.—Major BASIL McEWEN, R.F.C., Capt. CHARLES DANBY, Royal Engineers and R.F.C., Capt. ERIC MURRAY, Corps of Guides, Indian Army, attd. R.F.C., Capt. MALCOLM BELL-IRVING, R.F.C., Sec. Lt. CUTHBERT SHORT, R.F.C.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Messrs. A. W. Southam and O. R. Gayford granted temp. commissions as Sub-Lt. (R.N.V.R.), seny. respectively Oct. 12th and 15th.

Oct. 18th.—Flt. Sub-Lt. (Temp.).—H. G. Brackley, promoted to Flt. Lt., seny. Oct. 1st.

The undermentioned have been entered as Proby. Flt. Officers (temp.), seny. Oct. 22nd, and apptd. as follows:—A. H. Webber, E. H. Jenkins, F. W. Akers, L. T. Clemence, H. L. Brown, J. A. Rudd, H. C. Nutt, M. J. Watson, T. H. Boyd, J. R. Attwell, P. F. T. Luckham, J. H. Broughton, F. L. B. Wood, D. A. Lancaster, A. J. R. F. Johnson, and G. M. Emerson, all to "President," for R.N.A.S.; V. R. Cox, W. R. Owen, and J. W. Pinder, to "President," addl., for R.N.A.S.

Mr. F. B. Rigby, granted a temp. commission as Lt., seny. Oct. 14th, and apptd. to "President," addl., for R.N.A.S.

Oct. 20th.—Chief Petty Officer (2nd grade) A. C. Jones entered as Proby. Flt. Officer for continuous service, seny. Oct. 17th. Mr. W. R. Curtis entered as Proby. Flt. Officer (temp.), seny. Oct. 22nd. The undermentioned have been granted temp. commissions (R.N.V.R.), seny. as follows: Lt. R. C. Philpott, Oct. 18th. Sub-Lts., Chief Petty Officer (A.A.C.); N. C. D. Coleman, and Petty Officer (R.N.V.R.) T. C. Spurway, Oct. 17th. J. Milton and S. S. Tyler, Oct. 18th.

Oct. 21st.—Lt. (Temp., R.N.V.R.).—T. A. Monckton, promoted to Lt.-Comdr. (temp.), seny. Oct. 19th. The undermentioned have been entered as Proby. Flt. Sub-Lts. (temp.), seny. as follows: A. C. Reid, Aug. 2nd. T. F. Fergie and A. M. Young, both Sept. 27th.

Oct. 21st.—Messrs. J. Coates and T. V. Hughes have been entered as Proby. Flt. Officers (temp.), seny. respectively Oct. 18th and 19th, and both apptd. to "President," addl., for R.N.A.S.

Oct. 24th.—The following have been granted temp. commns. (R.N.V.R.), seny. Oct. 21st:—Lt.—A. B. Wheldon. Sub-Lt.—H. G. L. de Whalley and C. F. Pallot.

NAVAL OFFICIAL COMMUNIQUEES.

OCT. 21st.—On the morning of the 20th instant a naval single-seater aeroplane attacked and brought down a hostile kite balloon near Ostend. The balloon descended in flames.

A similar machine engaged a large hostile double-engined tractor seaplane, shooting both pilot and observer. The seaplane side-slipped and dived vertically into the sea two miles off Ostend. The remains were later seen floating on the water.

Both our machines were undamaged.

OCT. 22nd, 9.30 p.m.—A hostile seaplane was shot down and destroyed this afternoon by one of our naval aircraft. The enemy machine fell into the sea.

Judging by the time, it is probably the seaplane that visited Sheerness to-day.

[See Home Command Communiqués (Military) of Oct. 22nd.—Ed.]

OCT. 23rd.—There is no truth in the statement, contained in a report from Amsterdam of a Berlin official telegram dated Oct. 21st, that a British destroyer operating off the coast of Flanders was hit by a bomb dropped from a German seaplane squadron.

THE CASUALTY LIST.

Reported Oct. 24th.

ACCIDENTALLY KILLED.—Hardstaff, Flt. Lt. Leslie H., R.N.
DIED OF INJURIES.—Greenwell, Prob. Flt. Sub-Lt. Arthur E., R.N.

SEVERELY INJURED.—Marix, Squdn. Comdr. Reginald L. G., D.S.O., R.N.

INJURED.—Davis, Actg. Sub-Lt. Somerville W., R.N.

Bowman, Prob. Flt. Sub-Lt. Geoffrey G., R.N.

SLIGHTLY INJURED.—de St. Leger, Flt. Sub-Lt. Rene J. M., R.N.

PRISONERS OF WAR IN GERMANY. — Butterworth, Flt. Sub-Lt.

Charles H. S., R.N.

Newman, Flt. Sub-Lt. Carl D., R.N.

Rockey, Flt. Sub-Lt. John S. N., R.N.

PERSONAL NOTICES.

DEATHS.

GREENWELL.—Flt. Sub-Lt. Arthur Robert Greenwell, aged 19, died at Lincoln on Oct. 20th from injuries received in a flying accident. At the inquest it was stated that the machine nose-dived at 200 ft., and the aviator's skull, thigh, and arm were fractured.

* * *

HARDSTAFF.—Flt. Lt. L. H. Hardstaff was killed on Friday, Oct. 20th, when testing an experimental machine, the tail of which broke. One is unfortunately debarred from discussing the cause of the accident by the fact that the machine was of a new type. Leslie Hardstaff, though he only learned to fly recently, was one of the most brilliant pilots this country has produced. He was able to fly any type of machine with equal ease, and his judgment of pace and distance was unsurpassed. He had, moreover, the gift of being able to fly a machine and describe thereafter the precise qualities of it, and to point out where alterations or improvements were needed. Whether as a cross-country pilot or an aerodrome performer, he had very few equals.

Owing to his many high qualities as a test pilot, he has done good service to the R.N.A.S. in improving the types of aeroplanes, so that from a purely Service point of view he is a great loss to the country. Personally, he made many friends both in and out of the Service during his short aeronautical career, and he will be greatly missed by all who knew him.

Leslie Hardstaff was a brother of Flt. Lt. R. C. Hardstaff, formerly an instructor at the Eastbourne aviation school with Mr. (now Flt. Comdr.) Bernard Fowler, and since then one of the most successful instructors in the Naval Air Service. To the late officer's family all will offer their deepest sympathy.

* * *

NEWMAN.—Flt. Sub-Lt. C. D. Newman, reported missing, is a son of the Rev. C. H. Newman, Vicar of St. Mark's, Sunderland. He was a student at the Medical College, Newcastle, when war broke out. After serving as a surgeon-probationer for a year, he was transferred to the Royal Naval Air Service. He went to France only five weeks ago.

* * *

"Canada" of Oct. 9th says:—

Flt. Sub-Lt. James Douglass Scott, R.N.A.S. (killed on Sept. 21st), was the youngest son of Mr. and Mrs. John Scott, of Montreal. He was educated at Montreal High School, and joined the staff of the Royal Bank of Canada. Several years later he went West, and engaged in real estate business in Regina. In August, 1915, he enlisted in the R.N.A.S., and received his training in the Curtiss School, Toronto. He leaves a widow and one child.

BIRTH.

KNIGHT.—On Oct. 16th, at Sandroyd, Redcar, Yorks, the wife of Flt. Sub-Lt. R. V. Knight, R.N., of a daughter.

Squdn-Comdr. Reginald Marix, D.S.O., who is noted as having been seriously injured, came by his injuries owing to a fall with a French machine which he was testing near Paris. He broke both legs and also sustained severe concussion, and for a period was in a very critical condition. At the time of writing he is reported to be out of danger, but it is said to be doubtful whether he will ever fly again. However, one recalls instances in which pilots have been equally badly damaged and have yet distinguished themselves highly on active service afterwards—as for instance the officer who successfully bombed Constantinople. One hopes therefore that Squdn-Comdr. Marix may make a complete recovery.

* * *

"South Africa," of Sept. 9th, publishes a letter from the mother of Flt. Lt. Gasson, R.N.A.S. The following is an extract therefrom:—

"I have just received a letter from my son, Flt. Lt. C. B. Gasson, R.N.A.S., saying he is at Bagdad, and being well treated by the Turks, and that his wounds are improving. My son was wounded and brought down when flying his seaplane, taking food to the forces at Kut. That happened on April 26th, and this is the first news we have had from him. He was wounded in the head, shoulder and foot, and his observer was killed. He is the son of Mr. George H. Gasson, Queenstown,

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South Africa. Flt. Lt. C. B. Casson is himself an old South African, and has many friends who would like to know he is safe.
(Signed) E. M. GASSON.
"Larigg," Stonehaven, N.B., Sept. 5th, 1916.

A man who was alleged to have tried to bribe an Admiralty official because he thought "it was the usual thing to do" was brought up at Bow Street on Oct. 21st, when George Smellie, who was in khaki, was summoned under the Prevention of Corruption Act for offering a bribe to Mr. William Pettit, head of the registry staff of the Board of Invention and Research at the Admiralty.

In May of this year Smellie went to the Board with particulars of an aeroplane, a provisional specification, and a model. Later a woman handed to Mr. Pettit a letter, the writer of which said that if he sold his patent or obtained an order for one or more machines, "half of what I get through you is yours, or if a third party is to be considered you may make what arrangements you think fit."

After other evidence the hearing was adjourned.

MILITARY.

G.H.Q. COMMUNIQUE.

Oct. 17th, 10.26 p.m.—The clear weather of yesterday gave scope for great aerial activity. Our machines made a large number of reconnaissances and bombed enemy railway lines, stations, billets, factories, and depots.

There were numerous fights in the air, three enemy machines being destroyed, another driven to earth, and many dispersed.

Two enemy kite balloons were attacked and forced down, one being afterwards seen in flames.

One of our machines was brought down by anti-aircraft gunfire, and six others have not returned.

Oct. 18th, 9.38 p.m.—Yesterday, besides many reconnaissances, our aircraft carried out three bombing raids against enemy communications, in which railway stock and station buildings were damaged, and a train hit and derailed.

There were many fights in the air, in the course of which four enemy machines were driven down damaged, and one fell into a lake. Four of our machines have not returned.

Oct. 21st, 10.55 p.m.—Yesterday, the weather being clear, much successful work was done by our aircraft. We bombed enemy communications and attacked, among other points, an important junction and an ammunition depot, and derailed four coaches of a train.

There was continuous fighting in the air, in which three enemy machines were destroyed, and many others driven down in a damaged condition. Two of our machines are missing.

Oct. 22nd, 9.12 p.m.—During yesterday's fighting our aeroplanes did valuable work in locating enemy batteries. Five enemy machines were destroyed and four others driven down in a damaged condition. Three of our machines are missing.

Oct. 23rd, 9.40 p.m.—Yesterday our aeroplanes bombed two railway stations behind the enemy's lines, hitting a train in motion and doing much damage to buildings and rolling stock. Seven enemy machines were brought down and many others forced to land in a damaged condition. Eight of our machines have not returned.

[On balance, the Germans seem to have suffered least, but as the R.F.C. was attacking over enemy territory it is possible that the missing machines may have been brought down by engine failure.—Ed.]

WAR OFFICE COMMUNIQUE.

Oct. 19th.—The General Officer Commanding the British Forces in Egypt reports:—(Eastern Front, Moghara, Oct. 15th).—After an engagement lasting two hours, during which our aeroplanes repeatedly bombed the enemy main positions, we succeeded in driving him out.

HOME COMMAND COMMUNIQUE.

Oct. 22nd, 4 p.m.—A hostile aeroplane approached Sheerness at about 1.45 p.m., flying very high.

Four bombs were dropped, three of which fell in the harbour. The fourth fell in the vicinity of the railway station and damaged several railway carriages.

British aeroplanes went up and the raider made off in a north-easterly direction.

No casualties are reported.

Oct. 23rd, 12.40 p.m.—A hostile aeroplane was reported over Margate at 10.5 this morning.

Three bombs were dropped in the Cliftonville district of the town. Slight damage was caused to an hotel, and one man and one woman were slightly injured.

British aeroplanes went up in pursuit of the raider, who made off in a south-easterly direction.

THE CASUALTY LIST.

Reported Oct. 18th.

KILLED.—Adams, Capt. R. N., R. Fus. and R.F.C.

WOUNDED.—Franklin, Sec. Lt. R. V., R.F.C.

MISSING.—Hayne, Sec. Lt. M., Lancs Fus. and R.F.C.
Lawledge, Sec. Lt. F. M., R.E., attd. R.F.C.
Lawton, Lt. J. B., Buffs (E. Kent R.) and R.F.C.
Middlebrook, Sec. Lt. N., Rif. Brig. and R.F.C.
Copeland, Lt. A. H. M., Canadian A.S.C., attd. R.F.C.

Reported Oct. 19th.

KILLED.—Kidd, Sec. Lieut. L. C., R.F.C.

Phillips, Sec. Lieut. F. E. S., Devon R. and R.F.C.

WOUNDED.—Corry, Sec. Lt. F. M., Sherwood For. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMAN HANDS.—Odling, Lieut. V. G., R. Berks R., attd. R.F.C.

Reported Oct. 21st.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Steytler, Sec. Lt. E. D., S. Lancashire Regt., attd. R.F.C.

WOUNDED.—Duff, Capt. T. R., Argyll and Suth'd Highrs. and R.F.C.

Smith, Sec. Lt. S. M., London Regt. and R.F.C.

R.F.C.—Jenner, 45633 2nd Cl. Air Mech. S. C.

Reported Oct. 23rd.

WOUNDED.—Nixon, Sec. Lt. W. E., K. O. Scottish Bord. and R.F.C.

MISSING.—Crisp, Sec. Lt. A. R., R.F.C.

R.F.C.—Grundy, 6709 1st Cl. Air Mech. A.

DIED OF WOUNDS.—R.F.C.—Chadwick, 8651 2nd Cl. Air Mech. H.

DIED.—R.F.C.—Wilson, 1147 1st Cl. Air Mech. A. C.

CORRECTION.—PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Browning-Paterson, Lt. N. A., R.A. and R.F.C., should read Browning-Paterson, Capt. N. A., R.A. and R.F.C.

INDIAN FORCES.—PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Gray, Capt. D. B., Indian Infantry, attd. R.F.C.

OVERSEA FORCES.—DIED.—Woodrow, Lt. S., Australian F.C.

Reported Oct. 24th.

KILLED.—Carré, Lt. E. M., Lincoln Regt., and R.F.C.

DIED OF WOUNDS.—Stewart, Lt. J. A., R.F.C.

WOUNDED.—Douglas, Sec. Lt. C. K. M., R.F.C.

Kent, Sec. Lt. W. M., R.F.C.

MISSING.—Douglas, Sec. Lt. A., R.F.A. and R.F.C.

Hugill, Sec. Lt. V. F. H., R. Fusiliers, attd. R.F.C.

Kelly, Sec. Lt. C. M., R.F.C.

Sturrock, Sec. Lt. T. G. G., R. Scots, attd. R.F.C.

Thompson, Lt. J., R.F.C.

Tidswell, Capt. C. R., Dragoons and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Le Bas, Lt. O. V., R. West Surrey Rgt. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONERS IN GERMAN HANDS.—Macintosh, Sec. Lt. F. G., R.F.C.

Wingfield, Sec. Lt. E. H., R.F.C.

PREVIOUSLY REPORTED BELIEVED TAKEN PRISONERS AT KUT-EL-AMARA, NOW REPORTED PRISONERS OF WAR.—R.F.C.—Nickolls, 7373, 2nd Cl. Air Mech. R. G. (Hackney, N.E.); Wells, 7870, 2nd Cl. Air Mech. S. J. (Sherborne).

BELIEVED TAKEN PRISONER AT KUT-EL-AMARA.—R.F.C.—Fairhead, 3388, 2nd Cl. Air Mech. W. (Burton-on-Trent).

* * *

A telegraphic dispatch, dated Oct. 19th (6.10 p.m.), giving a summary of recent operations, has been received by the War Office from General Headquarters in France, which says:—

The weather during the course of the operations reviewed has been consistently unfavourable for aircraft. Heavy rains and strong south-westerly winds have lowered the visibility and have rendered their work most difficult. Yet, in spite of such adverse conditions, our machines have made many valuable reconnaissances and have repeatedly attacked with success enemy lines of communications, ammunition dumps, and troops on the move.

A captured document emanating from a German Army Headquarters, in acknowledging the superiority of the British aviators, suggests methods of reorganisation whereby it is hoped that "it will be possible, at least for some hours, to contest the supremacy in the air of the enemy."

Assisted by our aeroplanes, our artillery has continued to play a notable part in the fighting. It has established and maintained a clear superiority over that of the enemy. It has supported our infantry attacks and has disorganised the enemy's arrangements behind his front lines and hindered the arrival of his reserves and supplies. It allows him no rest by day or night and materially assists in that wearing down of his moral which is vital to success in battle.

* * *

The Army order forbidding aviators to accept monetary presents for the destruction of Zeppelins, which was foreshadowed by Mr. Lloyd George in the House of Commons on Oct. 17th, was issued the following day. The following paragraph is added to the King's regulations by the new order:—

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are forbidden to accept presents in money from public bodies or private individuals in recognition of services rendered in the performance of their duty.

* * *

At Maidenhead, Mr. T. W. Stuchbery, the coroner, investigated on Oct. 21st the death of a Burnham (Bucks) tradesman, named Henry Lancelot Madle, who was knocked down by a motor-car, and the jury returned a verdict of manslaughter against Lt. William George Cowie, R.F.C., who was driving. Elizabeth Madle, daughter of deceased, said her father was 51. They were going to Maidenhead from Burnham on the 14th inst., and when at Ray Park Avenue, near Maidenhead Bridge, at six p.m., a motor-car came round the corner and struck her father. The car knocked her father down and dragged him nine yards. The car went straight away down Ray Park Avenue, and did not stop. She heard no hooter nor any warning. The car took a wide sweep round the corner.

Capt. Arthur Reginald Raby, R.N., retired, of Bath, staying at a house 200 yards from the scene, said the car was travelling from twelve to fifteen miles an hour. No warning signal was given. He thought the car was being driven in a very dangerous manner. He yelled to the driver to stop, but the latter put on speed and disappeared. The coroner gave Lt. Cowie and Lt. Sayer, who were present, an opportunity to give evidence, but both declined.

Superintendent Davis said: On Friday last the two officers called at the police office. Lt. Cowie said, "I have called to say that I will take the responsibility for the accident." Witness remarked, "You mean knocking the man down last Saturday night?" and Lt. Cowie replied, "Yes," and admitted that he was the driver of the car. After 15 minutes' deliberation 13 of the 15 jurymen returned a verdict that deceased came by his death through injuries sustained by being knocked down by a motor-car negligently driven by Lt. William George Cowie, R.F.C. The two dissenting jurymen considered it a case of accidental death.

Mr. Cowie was, on the coroner's warrant, committed for trial to the Berks Assizes. Bail was allowed.

* * *

It is reported that a motor wagonette accident, in which 13 men of the Surrey Volunteer Regiment were injured recently, was seen by the pilot of an aeroplane, who flew to Brooklands for assistance, with the result that a R.F.C. ambulance was sent at once to the scene of the accident.

* * *

At Dover Borough Tribunal the military representative applied for the withdrawal of eight certificates of exemption granted to members of the Dover Anti-Aircraft Corps, which was recently disbanded. He claimed that the Tribunal had not the power to grant these exemptions, as the men were at the time of their application members of the Forces of the Crown, and the certificates were therefore ultra vires. The men were of military age, and, as partially-trained men, would be of special value to the country. Some of the men were legally represented. The Tribunal withdrew the certificates in several cases, and granted shorter terms in other cases. As the certificates would shortly run out, the military representative withdrew his applications.

* * *

The Eton Tribunal has protested against single young men passed for general service who are neither aviators nor mechanics being allowed to join the Air Services and perform work which elderly men could do.

[Which is a very reasonable protest. To which one would add that the R.F.C. loses quite a fair number of really good mechanics because the examining people would apparently rather have a bad mechanic who has served his time to a trade than a good mechanic who has not.]

* * *

Lt. Alan Bott, whose name appears in the official list of Oct. 21st of officers who have been awarded the Military Cross for gallantry and devotion to duty in the field, is a member of the editorial staff of the "Daily Chronicle," and when war broke out acted for a time as a special correspondent in France and Switzerland. He went to Lake Constance to investigate the building of super-Zeppelins, and while at Kreuzlingen, a small Swiss town which is really a suburb of Constance, made an involuntary trip into Germany by entering the wrong train.

He spent some hours in Constance, and managed to escape detection at the frontier by travelling under the seat of a cab driven by a friendly Swiss who was going back to Kreuzlingen.

On his return to England, in November, 1914, Mr. Bott joined the O.T.C., and after training received a commission in the R.G.A., whence he transferred to the R.F.C.

PERSONAL NOTICES.

DEATHS.

BROWNING-PATERSON.—Capt. N. A. Browning-Paterson, R.A. and R.F.C. (killed), was the younger son of Dr. A. Browning-Paterson, Coningham House, Uxbridge Road, W., and was 22 years of age. He was reported missing on July 21st, and is now officially stated to have been killed in an aerial action while leading a patrol over the enemy lines.

Capt. Browning-Paterson accompanied the first Expeditionary Force in August, 1914, as Sec. Lt., taking part in the retreat from Mons and subsequent battles, receiving mention in dispatches by Viscount French. He was transferred while at the front to the R.F.C. as Observer in Sept., 1915, and was gazetted Capt. and graded as Flt. Comdr. on July 3rd.

* * *

CARRÉ.—Killed in action, on Oct. 16th, Edward Mervyn Carré, Lt., R.F.C., youngest and dearly loved son of the Rev. Arthur A. Carré and Mrs. Carré, Smarden Rectory, Kent, aged 22.

* * *

COOPER.—Capt. Jack Cooper, R.F.C., who was officially posted as missing on July 21st, is now reported by the Geneva Red Cross to have been shot down and killed on that date over the German lines whilst on a bombing expedition.

He was 20 years of age, and was the youngest son of Lady Cooper, of Ossemsley Manor, Christchurch, Hampshire. Capt. Cooper was educated at Lockers Park and Harrow, and returned from Australia for the war. Capt. Cooper joined the R.F.C., and got his commission in January, 1915. He was considered by all who knew him one of the most promising men in the R.F.C., and if he had been spared would have had his Squadron before he was 21.

* * *

KIDD.—Killed in action, on Oct. 12th, 1916, L. C. Kidd, M.C., Sec. Lt., R.F.C., second and dearly loved son of Dr. H. Cameron Kidd, Bromsgrove, Worcs. Aged 23.

Mr. Kidd, M.C., was educated at Bromsgrove School. He took his pilot's certificate at Hendon before the war, and was tea-planting in Ceylon when war was declared. He returned as soon as possible, and was at once given a commission in the R.F.C., and, after a short period of home training, went to the front in February last. Since then, with two short intervals of leave, he has been flying continuously at the front. He was awarded the Military Cross only a week or so ago.

* * *

LUCAS.—Sec. Lt. Frederick Richard Lucas, R.F.C., 18, was killed while making his first cross-country flight on Oct. 22nd.

At the inquest on the following day at Rustington, Sussex, the evidence stated that after gliding down to a height of about 500 feet he started the engine again, had a nose-dive and went over on his back with the wheels in the air. The machine then banked up suddenly, but fell back and made another nose-dive to earth with the engine still running.

A verdict of accidental death was returned.

* * *

PHILLIPS.—Killed in action on Oct. 12th, 1916, Lt. F. E. S. Phillips, Devon Regt. and R.F.C., eldest and dearly loved son of the Rector of Bow, Devon, and Mrs. Phillips, aged 21 years. Indian papers, please copy.

* * *

STEWART.—Lt. James Aitchison Stewart, R.F.C., died from wounds, was 26 years of age, and the eldest son of Dr. Robert Stewart, 25, George Square, Edinburgh. He leaves a widow, who resides in Wiltshire. Mr. Stewart was educated at Edinburgh Academy and Edinburgh University. Before the war he held a commission in the 7th Royal Scots, but resigned it in May, 1914. Immediately on the outbreak of war he was appointed to a commission in the King's Own Scottish Borderers, and after being at the front for a time was invalided home with rheumatism. Subsequently, he was transferred to the R.F.C. He received the wound which caused his death in a fight in the air.

* * *

VERNON-INKPEN.—Lt. Robert C. Vernon-Inkpen, Royal Warwickshire Regt., attached R.F.C., was accidentally killed while flying on Oct. 21st. He was the only son of Mr. G. C. Vernon-Inkpen, of Southsea. He was 27 years of age.

At the inquest it was stated that Mr. Inkpen was trying to climb too steeply when the machine side-slipped and fell 80 ft. A verdict of accidental death was returned.

* * *

"Canada" of Oct. 9th says:—

Lt. Ian Cameron Macdonell, R.F.C. (reported missing on July 2nd, now reported killed), was the only surviving son of Brig.-Gen. A. C. Macdonell, C.M.G., D.S.O. He was educated in Winnipeg, and, coming to England, he passed through the Bristol School of Flying at Brooklands, and in December, 1913, obtained his brevet from the Royal Aero Club as a pilot. Soon after the outbreak of war he was gazetted a Lieutenant in his father's regiment, Lord Strathcona's Horse. In March, 1915, he became A.D.C. to Brig.-Gen. J. E. B. Seely, C.B., D.S.O., commanding the Canadian Cavalry Brigade. In September, 1915, he became attached to the R.F.C., and was gazetted Flying Officer in November. He met with a serious accident in December, but reported for duty in May, 1916. He was 21.

* * *

Lt. Hugh Edward McCutcheon, Worcestershire Regt., attached R.F.C. (killed), belonged to Greenwood, B.C. He was a student

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of Toronto University. He joined the 1st Canadian Contingent as a private, and afterwards went to the Front with his battalion with the rank of Corporal. In January, 1916, he was transferred to the Worcester Regiment, and later obtained a commission in the R.F.C. He was 27 years of age and unmarried.

ENGAGEMENTS.

GRACE—APPERLY.—An engagement is announced between Mr. Frederic Arthur Darien Grace, second lieutenant, R.F.C., late of San Pedro de Jujuy, Argentine, eldest son of Mr. and Mrs. A. A. Grace, of Alberdi, Santa Fé, Argentine, and Sybil May, youngest daughter of Mr. and Mrs. Herbert Apperly, of Highwoods, Kingswood, Surrey.

* * *

KNOWLES—BERNERS.—An engagement is announced between Robert Millington Knowles, Norfolk Regiment and R.F.C., younger son of the late Andrew Knowles and Mrs. Knowles, of Taverham Hall, Norwich, and Olive Marjory, younger daughter of Major and Mrs. J. A. Berners, of Hellesdon House, Norwich.

* * *

McCLINTOCK—LAIRD.—A marriage has been arranged between Ronald St. Clair McClintock, R.F.A. and R.F.C., youngest son of Mr. and Mrs. Arthur McClintock, of Rathvinden, Leighlin Bridge, Ireland, and Mary Gordon (Milly), elder daughter of Mr. and Mrs. John Macgregor Laird, formerly of Birkenhead, at present at the Hyde Park Gate Hotel, Kensington Gore, S.W.

MARRIAGES.

EYTON—CARBUTT.—The marriage of Major Sandford Wynne Eyton, R.F.C., and Miss Frances Carbutt took place on Oct. 24th at St. John's Church, Southwick Crescent, W.

* * *

PAYZE—FROST.—On Oct. 4th, 1916, at Ponteland Parish Church, by the Rev. F. W. Langton, Capt. Arthur Payze, R.F.C., son of Percy Owen Payze, of Henley-on-Thames, to Peggy, only daughter of Charles Henry Frost, of Newcastle-on-Tyne.

BIRTH.

HOOK.—On Oct. 20th, at Silverbeck, Churt, Farnham, the wife of Oliver Hook, Lt., R.F.C.—a son.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Oct. 17th.—German aeroplanes dropped several bombs on Amiens without doing any military damage.

Our aeroplanes carried out numerous flights in the region of the Somme. They fought 65 engagements, in the course of which two enemy machines were brought down and three others came precipitately to earth in their own lines.

Oct. 18th.—In spite of misty weather, our fighting aeroplane service displayed activity during the 17th. Three enemy aeroplanes were brought down on the Somme front. One fell in the direction of Aizecourt-le-Haut, the second to the east of Bouchavesnes, and the third, attacked by Lieut. Heurteaux, crashed to the ground between Roguigny and La Transloy, bringing the number of aeroplanes brought down by this pilot to nine up to to-day.

One of our aviators, who was attacked by three Fokkers between Roye and Lassigny, brought down one of his opponents and put the other two to flight.

Oct. 19th.—Yesterday our machines during the operations to the south of the Somme attacked with machine-guns the enemy troops in the region of Biaches.

It is confirmed that Adjudant Dorme brought down on the 16th a German aeroplane to the north of Péronne, this being the 14th machine for which this pilot has accounted.

Another enemy aeroplane which was reported to have been badly hit on the same day fell to the ground and was dashed to pieces near Beaulencourt.

Oct. 21st.—Yesterday our chasing aeroplanes had numerous combats, in the course of which seven German machines were brought down, three of them in our lines. The latter fell between Bouchavesnes and Rancourt; the four others in the region of Moislains and Brie. Lt. Heurteaux, who brought down one of them, thus accounted for his 10th German machine. Four other enemy machines, which were badly hit after fights with our pilots, were obliged to come down in their own lines.

During the night of the 20th one of our squadrons dropped 41 bombs of 120 mm. on the stations of Noyon and Chauny, and afterwards more bombs were dropped on a train between Appilly and Chauny.

On the same night 15 of our bombarding aeroplanes dropped 79 bombs of 120 mm. on the enemy cantonments and the bivouacs in the region of Nesle and Ham and on the aviation grounds at Marigny (north of Ham) and Slez, which were hit.

Oct. 22nd.—On the Somme front our aviators yesterday brought down three German aeroplanes. Five others were forced to land in a damaged condition. During these fights Adjudant Dorme brought down his 15th enemy machine at Barleux, and Maréchal

de Logis Flachaire his 5th machine, which was dashed to pieces on the ground in the same district.

To the north of Verdun a German captive balloon, which was attacked by one of our pilots, fell in flames.

During the night of the 21st six of our aeroplanes bombarded the railway station of Courcelles, to the east of Metz. 180 bombs of 120 mm. were dropped on the buildings and on the lines, and appeared to have caused much damage.

During the same night our squadrons dropped 50 bombs on the railway stations of St. Quentin and Tergnier, 16 bombs on bivouacs in the district of Étain, and 126 heavy bombs on the railway stations at Ham and Athies and the aviation sheds in the region of Péronne.

During yesterday a German aeroplane was brought down in our lines by the fire of our special guns.

Oct. 23rd.—This morning German aeroplanes dropped several bombs on Lunéville. There were no victims, and the material damage done was insignificant.

On the Somme front yesterday two German aeroplanes were brought down and three were forced to come down damaged.

Yesterday 24 of our machines dropped 4,200 kilogrammes (over four tons) of bombs on the blast furnaces of Hagondange and of Pussinges, north of Metz, on the railway stations of Thionville, Mézières-les-Metz, Longwy, and Metz-Sablons. They attained their objective.

On the same day another of our air squadrons bombarded an ammunition depot at Mons-en-Chaussée (Somme).

Finally, last night a bombing expedition against the factories of Rombach and the railway station of Mars-le-Tour achieved good results.

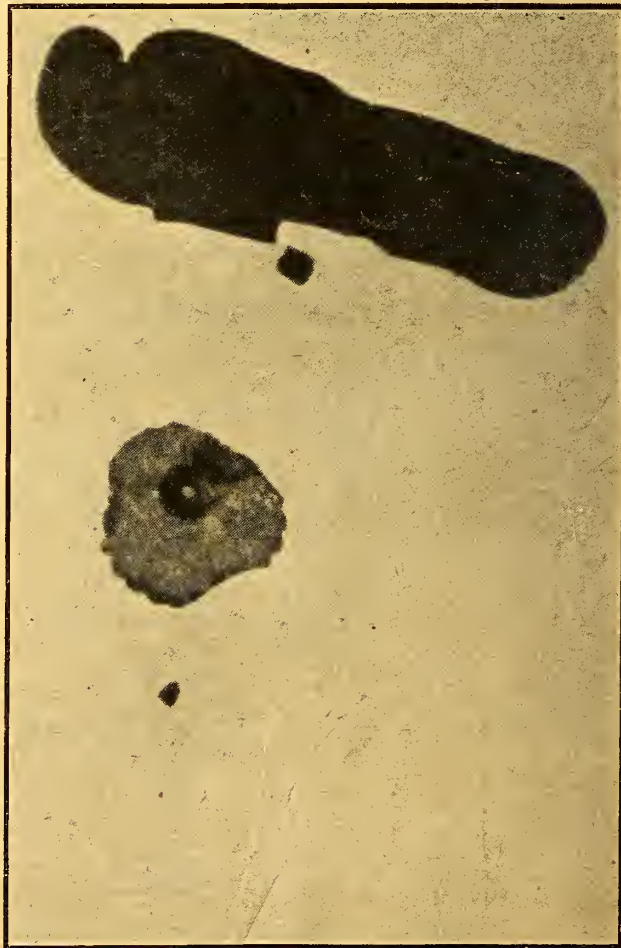
This morning some German aeroplanes dropped several bombs on Nancy. There were no casualties, and only slight damage was done.

* * *

According to a "Daily Telegraph" correspondent a new name has been added to the official list of French aviators considered worthy of mention in dispatches. This distinction is awarded only after an aviator has brought down his fifth enemy machine. The newest comer is Maréchal de Logis Flachaire, who began his air-fighting in March at the beginning of the Verdun battle.

* * *

The list of French aviators whose names have been mentioned



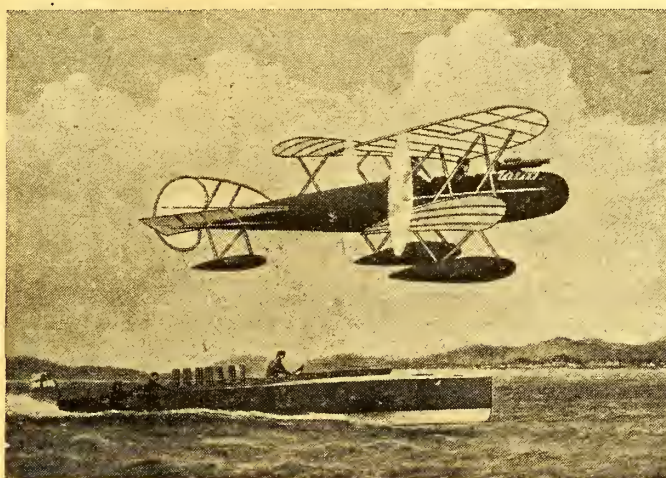
A French Observer descending by Parachute from a strated Kite Balloon.

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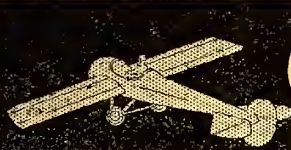
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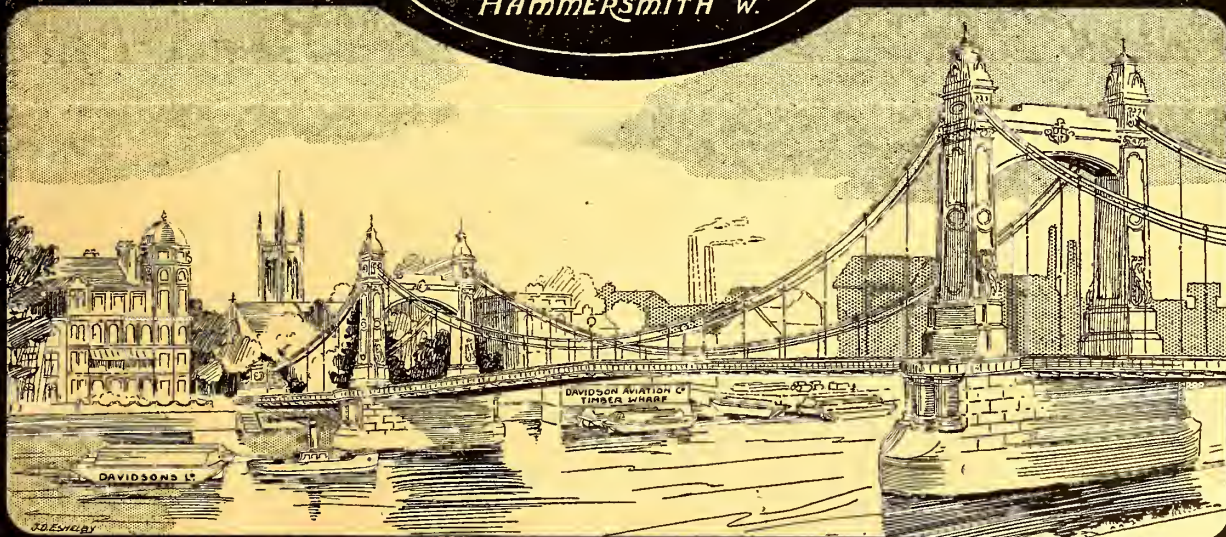


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in dispatches is as follows: Sous-Lieut. Guynemer has brought down 18 enemy machines; Sous-Lieut. Nungesser, 17; Adjudant Dorme, 15; Sous-Lieut. Navarre, 12; Adjudant Lenoir, 11; Lieut. Heurtaux, 10; Serg. Chainat, 9; Lieut. Deullen, 8; Sous-Lieut. Chaput, 8; Sous-Lieut. De la Tour, 7; Sous-Lieut. Pégoud, 6 (killed in action); Sous-Lieut. De Rochefort, 6 (killed in action); Adjudant Tarascon, 6; Adjudant Bloch, Sergt. Viallet, Sergt. Sauvage, Adjudant Lufbery (American), and Maréchal des Logis Flachaire, each 5.

GERMANY.

OFFICIAL COMMUNIQUÉS.

OCT. 17th.—In the course of operations against enemy batteries our aeroplane observers rendered valuable service.

Our battle aviators shot down six enemy aeroplanes and three of them fell behind the enemy's lines.

Captain Bölcke again put hors de combat two enemy machines.

OCT. 18th.—Five enemy aeroplanes were brought down in the course of aerial fighting.

OCT. 21st.—Our aerial battle squadrons protected our observation pilots during numerous aerial attacks, and 12 enemy aeroplanes were shot down, four of which fell behind our lines.

Aerial night attacks on railway stations and munition depots behind the enemy's front gave good results, many explosions and fires being observed.

The fighting in the Dobrudja has developed in our favour. German aerial squadrons successfully participated in the fighting from the air.

OCT. 23rd.—Near the coast and in the Somme and Meuse sectors there was very vigorous aerial activity.

Twenty-two enemy aviators were shot down in air-fights and by anti-aircraft fire; 11 are lying behind our lines.

Capt. Bölcke brought down his 37th and 38th and Lt. Frankl his 14th enemy in aerial fights.

Enemy aeroplanes bombed Metz and places in Lorraine. No military damage was done, but five civilians died and seven others fell ill as the result of inhaling poisonous gas emitted from the bombs.

(Roumanian Front).—Naval aeroplanes descended far behind the retreating enemy, destroyed two aeroplanes on the ground, and returned undamaged.

In the morning of Oct. 22nd enemy seaplanes attacked our East Frisian ports and islands. The attack was without result, and no damage was caused.

In the afternoon of Oct. 22nd one of our seaplanes successfully dropped bombs on the station and docks at Sheerness, at the mouth of the Thames.

On Saturday afternoon (Oct. 21) a German seaplane squadron successfully bombed English naval forces off the coast of Flanders. A hit was observed with certainty on one of the destroyers. All the aeroplanes returned safely, despite heavy firing.

* * *

An official statement on the air raid on the Mauser works at Oberndorf, issued on Oct. 20th, says:—

"Of the 40 aeroplanes our aviators and anti-aircraft guns shot down nine. The following pilot and observers were killed: Guerinau, Baron Georges, Jouan and Marchand.

"The following were made prisoners: Rockey, Sterdic, Bouet, Delorix, Buckworth, Nottay, Newman, Vittyn. The names of four of the occupants of the machines that were brought down could not be ascertained. No German machine was lost, and no aviator was killed or wounded in the action.

RUSSIA.

OFFICIAL COMMUNIQUÉS.

OCT. 18th.—DOBUDUSHA.—An enemy seaplane was hit by our artillery fire, and fell between the enemy lines and our own. The seaplane exploded during the fall, and was burnt.

OCT. 19th.—In the region of the village of Potutory, south of Brzezany, an enemy aeroplane landed, having been brought down by our artillery fire. The machine caught fire as it fell; we captured the aviator.

AUSTRIA.

OFFICIAL COMMUNIQUÉ.

OCT. 18th.—Our artillery forced an enemy hydroplane to land between our lines and those of the enemy. During its descent the hydroplane exploded and was burnt.

ITALY.

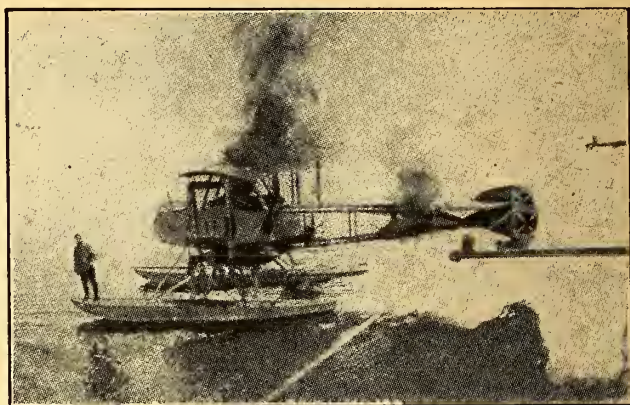
OFFICIAL COMMUNIQUÉS.

OCT. 19th.—Along the remainder of the front only artillery actions took place. On the Carso we captured some prisoners and a machine-gun in the course of small skirmishes. Hostile aeroplanes dropped bombs on Borgo Carinzia and on our lines east of Gorizia, without doing any damage.

Our aviators destroyed an enemy kite balloon at Castel San Giovanni (Ivanigrad), east of Comen (Carso).

OCT. 20th.—Hostile aeroplanes attempted to bombard the bridge over the But in the neighbourhood of Tolmezzo without success.

OCT. 23rd.—On both sides aircraft were engaged in reconnaissance work. As the result of an air fight which took place over the Frigido (Vippach) Valley (south of Gorizia) an enemy Albatros aeroplane was brought down.



A Twin-engined German seaplane burnt by its crew on being brought down.

It is semi-officially announced that French and Italian squadrons of seaplanes in the course of a general reconnaissance, carried out by them along the west coast of Istria on Oct. 16th, succeeded in spite of unfavourable weather in successfully bombarding detached naval units near Rovigo, as well as military works at Rovigo and at Punta Salvore. At one point they became engaged in a fight with enemy aeroplanes, and damaged two of them, one of which was seen to fall into the sea. In spite of enemy artillery fire all the seaplanes returned safely to their bases.

* * *

According to the Stefani Agency, on the afternoon of Oct. 16th, a squadron of Italian and French seaplanes during the course of a thorough exploration of the West Istrian coastline, carried through in daring fashion amid bad weather conditions, successfully bombarded some of the enemy's naval units caught away from their bases near Rovigno; also (military) works at Rovigno and Salvore Point.

When drawn into action by enemy aircraft the Italians succeeded in hitting two of them, one of which was seen to come down hastily into the sea. In spite of lively artillery fire all the seaplanes which set out returned safely to their base.

* * *

Another world's record—that "with two passengers"—has recently been bettered by the Italian Napoleon Rasini, who managed to insinuate 6,306 metres (21,000 ft.) between himself and the earth's surface at Mirafiori on a bi-motored — machine.

* * *

By-the-by, I am told with authority that a new all-Italian carburettor of simple and novel design is doing wonders of economy in even rotary engines. People have not really mistaken Gnomes for Rolls-Royces when they have come across one of the former fitted with the new gas-producer, but a wonderful deal of throttling down can be effected. Roughly I might call the instrument a two-jet, which would not describe it at all, as the petrol passes through both—and the air space between, one being the access to, the other being the exit from, a walnut sized mixing cylinder. This gives too a direct bypass, through a slide-valve actuated by the throttle, from the "access" jet to engine, a pilot jet in fact.

Messrs. the "Savoia" firm allow it to be circulated that they are supplying their machines to the Government at the rate of 1,000 per annum. Allowing, as I see elsewhere in print, that Italy has at least ten efficient factories—each capable, one may suppose, of turning out something perhaps approaching that figure—we have a total of roughly 10,000 machines a year, if supply and demand continue thus. Then there may be imported wares.

—T. S. H.

ROUMANIA.

OFFICIAL COMMUNIQUÉ.

OCT. 17th.—Our artillery forced an enemy seaplane to land between our lines and those of the enemy. During its descent the hydroplane exploded and was burnt.

BULGARIA.

OFFICIAL COMMUNIQUÉS.

OCT. 17th.—Hostile aeroplanes unsuccessfully bombed the railway station at Demir Kapu.

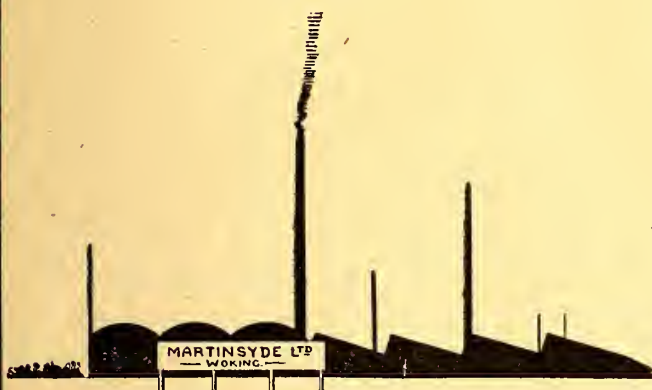
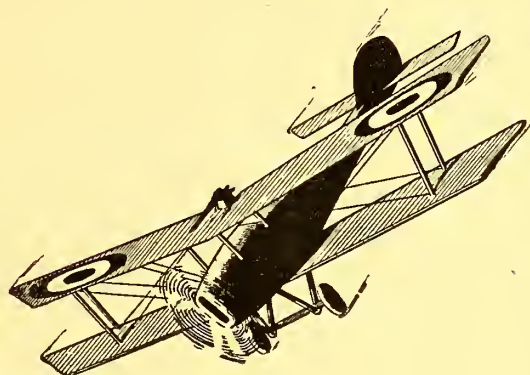
Near Tchajasa we shot down a hostile seaplane, which was destroyed by our artillery.

OCT. 18th.—Enemy aeroplanes unsuccessfully dropped bombs on Prilep.

HOLLAND.

It is reported that, on the night of Oct. 22nd, a Zeppelin manoeuvred over Holland, and as it flew over Gorinchem (20 miles south-west of Utrecht) it dropped what was alleged to be an incendiary bomb. Other accounts say that it was only a petrol tin. Whatever the missile was, it apparently created a good deal of indignation and some panic where it fell.

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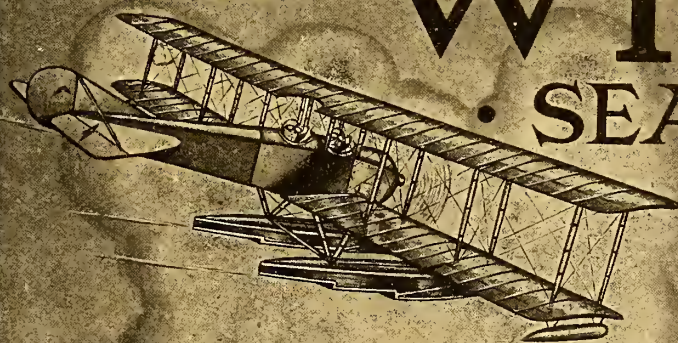


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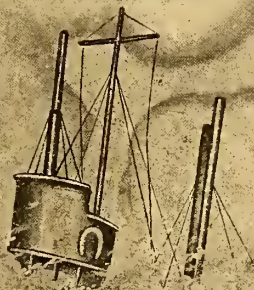
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THE INVASIONS OF ENGLAND.

The adjourned inquests were held on Oct. 12th on the bodies of twenty-eight victims of a recent Zeppelin raid on a North Midland town. The Coroner reminded the jury that the purpose of the adjournment was to ascertain whether evidence could be put before them upon certain questions. He had consulted the authorities and found that even if the full story could be given it would be inexpedient to do so. Having carefully considered the position, he asked the jury to return a verdict that these twenty-eight deaths were due to injuries caused by the dropping of bombs from hostile aircraft. For reasons he had given he asked them to be satisfied with that, and to refrain from adding anything further. The Town Clerk observed that many of the conclusions arrived at by the general public were based on imperfect knowledge or erroneous information. There had been no lack of effort on the part of the authorities to secure the best defences.

The Foreman of the Jury: It seems to me there is blame somewhere for things not being done which ought to have been done before.

The Coroner: I cannot allow you to express your individual opinion. I thought you had heard my advice. I hope you will bring in the verdict suggested. If you want to discuss other points please do so in private.

The jury retired for nearly half an hour, ultimately returning a verdict in accordance with the Coroner's instructions. They added as an expression of opinion that they were dissatisfied with the anti-aircraft preparations on this occasion, considering them very bad indeed.

[Major Baird, M.P., and others who are quite satisfied with things as they are, should note this expression of opinion.—Ed.]

* * *

According to a "Daily Chronicle" correspondent, the visit of a German aeroplane to Sherness on Oct. 22nd caused little sensation, though at the time people were returning to dinner. The aeroplane came over so high that few people saw it. The whole affair lasted only two or three minutes. Many people went to the station to see the effect of the bomb that had exploded near there. The others dropped harmlessly in the harbour. The damage was trifling, and the bomb could not have been very powerful. The railway carriages mentioned in the official communiqué were empty stationary carriages.

* * *

The Queen has presented an aluminium brooch made from the German airship brought down on Sept. 3rd at Cuffley, to be sold at the Red Cross Gift House, 48, Pall Mall, S.W.

One notes with regret that the Red Cross people sell certain souvenirs with a guarantee that they came off a "Zeppelin." Will someone explain the difference between this and obtaining money under false pretences?

A large number of pieces of aluminium from one of the airships brought down on Sept. 24th are also on sale at the Gift House.

* * *

Six men were summoned at Barnet Petty Sessions on Sept. 20th for not reporting to the military or police that they had found parts of the Zeppelin brought down at Potters Bar.

Pieces of the engines, the propellers, the framework and the envelope were found in their possession shortly after the fall of the Zeppelin.

Some of the defendants said that they purchased their relics from the military, and some that they took away the parts after making inquiry and satisfying themselves that they were doing no wrong.

Defendants were ordered to pay costs, and were bound over in 40s. to come up for judgment if called upon.

A WELCOME AMERICAN NEW-COMER.

Owing to the war it is obviously impossible to publish in this country the results of any scientific research or of practical experiments with aircraft, for the very good and sufficient reason that if the information published were of any value to aircraft engineers or pilots in this country it would equally be of value to the enemy. Therefore, the exchange of knowledge between technical and practical people in this country must necessarily be strictly limited.

For this reason it is well worth the while of those interested in the technical side of aeronautics to take notice of the production of a new American paper entitled "Aviation and Aeronautical Engineering." This is published twice a month by the Gardner-Moffatt Company of New York at the price of five cents per copy, and is really a serious attempt to produce a high-class paper concerned with the technical and practical side of aviation.

The purely news side of the game receives very little attention, and most of the paper is occupied by very serious but none the less highly interesting matter.

For example, the issue of September 15th contains a memorandum on the future development of military aeroplanes for the U.S. Army Air Service, prepared in the office of the officer in charge of the aviation section of the U.S.A. Signal Corps. There is a review by Alex. Klemin, including several diagrams of an article by Professor E. B. Wilson, on the Theory of an Aeroplane Encountering Gusts. Mr. Alex. Klemin is also contributing to the paper a series of articles constituting in themselves a complete course in aero dynamics and aeroplane design.

THE AIRSHIP ISSUE.

This day week the special Airship Number of THE AEROPLANE will appear. Among the features of the issue will be a consideration of the uses of airships in general, and a special illustrated description of the modern Zeppelin and its construction. It has been possible to secure much interesting information under this head owing to the facilities kindly afforded by the Air Department of the Admiralty for the inspection of a Zeppelin recently brought down.

A special feature will be a double-page picture showing two views of a modern Zeppelin airship, one illustrating the arrangement of the cars and the internal structure, and the other the control arrangement. There will also be a number of detail sketches showing various constructional details.

Another special feature will be a general history of airships, dating from the earliest successful efforts with petrol engines, and this section will contain probably the finest collection of airship photographs ever issued in one publication.

It is evident already that there will be a very big demand for this issue, and readers of THE AEROPLANE are advised to order their copies well in advance.

A LABOUR SETTLEMENT.

It is reported that a dispute in the aeroplane industry which might have developed into a serious quarrel has been averted through the good offices of the Labour Adviser.

One hopes that the settlement will be a gentle warning to walking delegates and other Labour agitators, but one regrets that we have not a stronger Government, for if we had been so blessed most of the leaders in this traitorous movement would have found themselves in khaki at 1s. a day within a week. Many of them are of military age, and a little discipline, discomfort, and blood-letting would do them a world of good, after their recent overpaid, over-fed, and over-pampered existence.

THE LORD MAYOR'S SHOW.

Captured aeroplanes will figure in the Lord Mayor's procession on November 9th. This paper does not support the proposal that pilots who have brought down German airships should take part in the Show, each labelled legibly for identification by the speculating mob.

A NEUTRAL'S VIEW.

The "Berliner Tageblatt's" "distinguished neutral" in his articles on England says that "there is an undoubted scarcity of trained men in the building trade. Such men as remain one sees here and there engaged in repairing houses damaged by Zeppelins. Every effort is made to remove as soon as possible the traces of damage done in air attacks."

L'ENTENTE CORDIALE.

A singularly truthful person just back from France tells the following story of two graceless Air Mechanics, R.N.A.S. The pair had gone on the spree in a French town—or as much of a spree as they could raise on diluted beer and thinned wine—and, being a trifle rowdy, were run in by the French provost-marshal, and released on giving names. Next morning the P.-M. called on the C.O., R.N.A.S., and regretted most politely that he was compelled to complain of the A.-M.s' behaviour. Naturally the C.O. promised to deal with them faithfully if the men could be identified. "Mais oui! M. le Capitaine," said the P.-M. "I 'ave 'ere ze names of the *mechaniciens*, as zey give zem to ze *sous-officier*, Air Mécanique George Robé and Air Mécanique Arri Tête. I leave ze punishment to you!"—And even then the C.O. failed to identify them.

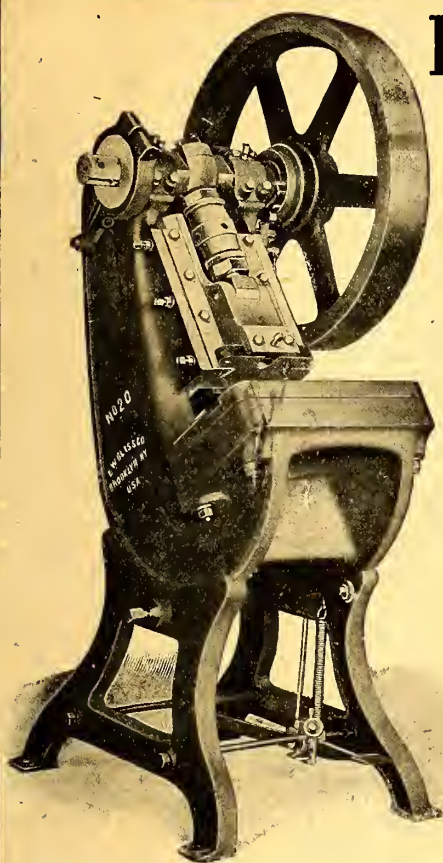
QUICK WORK.

In these days of war it is extremely difficult to get any kind of engineering work done for private or ordinary business purposes. This is due largely to the shortage of labour which makes many engineering firms extremely arbitrary in the matter of accepting repair work, especially when it happens to be of a trivial nature.

It is clear, however, that Barimar, Ltd., of Lamb's Conduit Street, W.C., and Poland Street, W., have not adopted this standpoint, despite the large amount of actual war-work they are doing. As a matter of fact it is the firm's declared policy to tackle any engineering repair job, no matter how small or how large, in the shortest possible time. The following is an illustration of the promptitude with which they can turn out work which some firms would not guarantee to put through in a month:—

A motor-cycle engine had been put out of action through one of the timing-gear spigots becoming unscrewed and reamering out a hole in the wall of the crankcase. The engine was dismantled, and the crankcase delivered at the Barimar works at 1 p.m. on Thursday last. The job was promised first thing on the following morning. The hole in the crankcase was welded up and then re-tapped to take the screw-thread of the spigot, and was quite ready for delivery at the time promised, and was duly taken away.

Of course, such a job was child's play to the skilful workmen employed by Barimar, Ltd., but the firm make it a rule to apply equal promptitude to the repair of a 100 h.p. crankcase, or to the execution of any other similar job they may undertake to carry out, and at a price strictly proportionate to the amount of labour involved.—W. L. W.



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THE CURIOUS ACTIVITIES OF THE AERONAUTICAL INSTITUTE.

The following letter has been sent for publication:—

Sir,—In view of the misrepresentation, which we hope is unwitting, but which has, nevertheless, continuously been made in your paper with regard to the Aeronautical Institute, with whose work you have never even attempted to make yourself acquainted, we trust that we may rely on your sense of honesty to publish this letter to inform your readers that in about a fortnight's time the Institute will issue its own organ, wherein it will be open to them, should they so desire, to learn all that there is to be learnt of the efforts, work, methods and hopes of the Institute.

In the meantime we may mention that its work has been considered of national value and that, in consequence, the only employee of military age out of the Institute's staff of fifteen has quite recently been badged.

It is quite untrue that the Institute makes "unauthorised use of the names of noblemen, officers and gentlemen who have withdrawn their support" and we challenge you to prove this statement which, among others quite as incorrect, appears in your issue of the 18th inst.

Since in that issue you also make mention of the Editor of "Truth," we desire to add that we have sent him a copy of this letter, and have invited him to inspect our Experimental Workshop.—I am, Sir, Yours faithfully,

(Signed) L. BLIN DESBLEDS.

P.S.—We reiterate our statement that any accredited member of the public can receive all information relative to the Institute by calling between 11 a.m. and 1 p.m. at 3, Arlington Street, St. James's, the address of the Institute.—L. B. D.

As regards the statement that the Institute makes unauthorised use of the names of people who have withdrawn their support, it has already been stated definitely in this paper that Lord Montagu of Beaulieu, Mr. Robert, Yerburgh, President of the Navy League, and Captain ap Ellis, R.F.C., have withdrawn their support.

One might add to these the name of Sir William Ramsey, who took the chair at the Institute's first meeting, and has since taken no part in its proceedings. In spite of this the Institute's touting letters refer to itself as having been formed under the chairmanship of Sir William Ramsey, thus distinctly conveying the idea that Sir William is still chairman.

Time is too valuable in these days to take the trouble to find out how much active support is being given to the concern by the 200 or so gentlemen whose names appear in its circulars, but it seems more than likely that the majority of them take no practical interest whatever in the affair, and have merely sent along a subscription under the patriotic impression that they were assisting a praise-worthy object.

Copies of the Institute's touting letters continue to arrive from all parts of the country. One gentleman who received one of these letters sends a subscription slip somewhat similar to those issued by clubs of good standing. The slip commits the signatory to an annual subscription of £1 1s., and to the following statement:—

"The Executive Committee of the Institute shall have power to enter my name among the class of membership to which the Rules of the Institute shall entitle me."

The grammar of the sentence is a trifle quaint, but the point really is that the subscriber is invited to subscribe to the Rules of the Institute. Inquiries on the part of one of the persons touted elicited the interesting fact that the formulation and printing of Rules has been postponed to a later date. Owing to this omission of Rules the Executive Committee, or the Director and Honorary Secretary, appear to be entitled to make any use whatever of the money obtained from people who subscribe in this blind way.

The Institute has issued recently an imposing leaflet setting forth in its usual pretentious and yet indefinite way the importance of its experimental workshop and laboratory. Apparently the chief asset of the said laboratory seems to be the fact that the Director of the concern began in September, 1909, to deliver lectures at various technical institutions such as the London Polytechnic, the Northampton Institute, the Royal Military Academy at Woolwich, the Manchester School of Technology and the Universities of Sheffield and Bristol. The curious thing is that none of these institutes appear to have arranged that this person should continue his lectures during the present period of aeronautical activity.

A booklet has also been issued concerning the experimental workshop and industrial laboratory. Nothing in this booklet is calculated to impress one with the fact that the said laboratory is capable of carrying out any tests whatever, the booklet chiefly consisting of a number of words which mean very little, and yet convey the impression that the laboratory is going to do something some day.

On the whole one still remains absolutely unconvinced that the Aeronautical Institute of Great Britain can be of any particular use to anybody except its promoters, and one is absolutely certain that it is not entitled to claim any scientific standing.

Finally, one would merely express a mild desire to know on whose authority and by what official department anybody con-

nected with the concern, who is of military age, has been badged as being of any importance to the nation? So far as one can see the intentions of the promoters of the concern may be strictly honest, but one fails utterly to see their utility.—C. G. G.

THE S.B.A.C.'s BADGE.

The Society of British Aircraft Constructors, which is the accredited body



formed to safeguard the interests of the Aircraft Industry, have now adopted a device for use by members on their notepaper, etc., indicating to all with whom they may be in correspondence that they are members of the Society.

The device is reproduced herewith, and one can quite understand that it meets with general approval, as the designer has managed to get away from the ordinary monogram used by most other Societies, and has produced a neat and distinctive device, which is quite an ornament to any firm's notepaper.

A CHANGE OF ADDRESS.

The Navarro Aircraft Company, Ltd., of Burton-on-Trent, wish it to be known that they have now closed their London Office, at 86, Gray's Inn Road, Holborn, and that all business will in future be conducted at their works at Burton-on-Trent, and that all correspondence should be addressed accordingly.

AN EXTENSION OF PREMISES.

The British Aeroplane Varnish Company, the proprietors of Titanine Non-poisonous-Dope, are taking new and more spacious offices at 166, Piccadilly, on the same floor as before, but at the end of the corridor.

Titanine has made a name for itself as the first practical non-poisonous dope, and orders for Government contracts are taxing the firm's large and highly organised works to the utmost.

The large amount of business handled by the firm must be due in no small measure to the enthusiasm and business acumen of Mr. D. Hutchinson, whose energies have led him into various strange lands to make Titanine known to Great Britain's Allies.

The British Aeroplane Varnish Company certainly deserve the support of the whole aviation industry, and to this firm's chemists the dope-shop hands owe a debt of gratitude for the effective demonstration they made that the use of tetrachlorethene and other poisonous ingredients in aeroplane varnish was totally unnecessary.

FLYING AT HENDON.

The flying which took place on Saturday last was quite up to the high standard which one is accustomed to associate with the London Aerodrome, and the pilots of the various school machines, no doubt stimulated by the invigorating effects of the cold but fine weather, kept a somewhat smallish assembly of spectators amused during the afternoon. The Caudron-type biplanes, which are so popular with several of the schools at Hendon for instructional purposes, were, of course, predominant, and flights were also made on Beatty-Wright and Grahame-White biplanes, the latter of the nacelle "pusher" type.

Much school work was done, and it is worthy of note that no "stunt" flying of any kind occurred, everybody being too busily engaged on more serious work.

Sundry Curtiss and B.E. biplanes were to be seen in various parts of the aerodrome, and two very interesting machines designed for the discomfiture of the Boche in diverse manners gave one the impression that the agitation for better machines which took place some time ago is beginning to bear fruit.

Incidentally, visitors travelling to the aerodrome by omnibus should note that Service No. 13, which travels from London Bridge Station via the city and West-End to Hendon, terminates at the "Bell," Hendon, and does not go to the aerodrome, in spite of the legend "To the Flying Ground" which was at one time displayed on these buses. On alighting at the "Bell," one has the choice of a 20-30 minutes' walk to the aerodrome, or a further five minutes' bus journey—this time by a different service—to a place considerably nearer the aerodrome.—A. H. P.

SCHOOL REPORTS.

AT THE HALL FLYING SCHOOL.

With Mr. Gerald Smith: Messrs. Bateman, Lambert Barton, Smith.

With Mr. Cecil M. Hill: Messrs. Dutton, Cowell, Lt. Malden, Bateman, Sergt. Jones.

With Mr. Fred J. Clegg: Messrs. Blake, Pugh, Course, Mayer, Heathcote, Yuill and Foster.

With Mr. Stanley G. Cowrie: Messrs. Gamble, Lester, Todd, Rogers, Hewett.

Certificates were taken by Messrs. Bateman, Sergt. Jones, Cowell, and Lambert Barton.

Machines: Hall Government-type tractors.

AT THE GRAHAME-WHITE SCHOOL.

Instructors: Messrs. Mantön, Winter, Pashley, Hale and Biard. Pupil with Instructor (Circuits) Lt. Kaizer.

Circuits alone: Messrs. Robertson, Steeves, Green, Woods, Travers, Whiteman, Lord, Norris, Hitchcock, Ranson, Sutherland, Munro, Rogers, Saunders, Styles and Zambournis.

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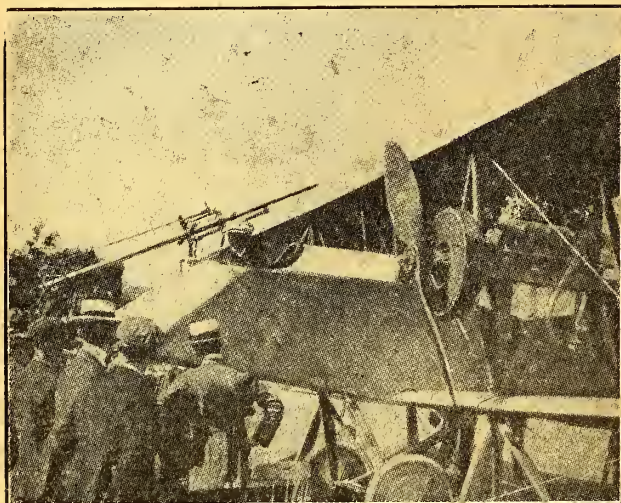
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

TRIAL SHOTS FROM A LARGE-BORE AEROPLANE GUN.

The new American paper "Aviation" gives the following account of some recent experiments with an aircraft gun:—

A large-bore aeroplane gun, said to be the largest fired from an aeroplane in America, was recently tried out on the field of



The Davis Non-Recoil Gun fitted to a Curtiss Twin-Engine Aeroplane, showing the method of mounting.

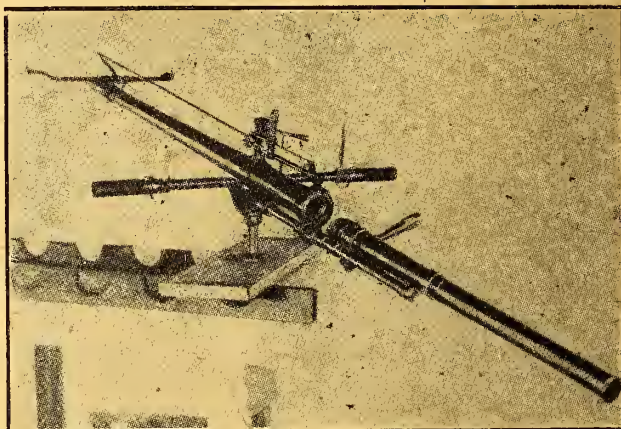
the Curtiss Company, at Buffalo, N.Y. The gun, which is of the non-recoil aeroplane type built by the General Ordnance Company of the Derby, Conn., was mounted on one of the Curtiss J-N. Twin tractors.

The machine was piloted by Aviator Carlstrom, and F. B. Towle, of the ordnance company, acted as gunner. In the test it is said that the machine ascended to the height of 4,000 feet, and that while flying at a high speed three successive well-aimed shots were fired. While the report of the gun could be heard for miles around, the pilot and gunner claim that so far as recoil or motion was concerned they would not have known that the gun had been discharged.

[The idea of the gun is that the recoils of the two barrels balance one another, the large barrel firing a shell and the smaller one

out, whereas with a fixed breach-block the shell must go out or burst the gun.

Another objection is that each charge—including the explosive—must weigh twice as much as the charge for an ordinary gun



The Davis Non-Recoil Gun, with the breach open. The Shell is fired from the big barrel on the right, and the compensating charge, of dust-shot or gas, creates, in theory, an exactly similar recoil in the opposite barrel.

of the same range. In fact it may weigh actually more, because the "point d'appui," so to speak, moves away as the exploding gas expands.]

AERONAUTICAL BOOKS.

Those who wish to extend their knowledge of the science and practice of aeronautics will do well to note that any book published on this subject can be obtained from the Wm. Dawson Publishing Co., Ltd., of Rolls House, Breems Buildings, E.C.

CONCERNING LATHE-WORK.

Every place that by any stretch of courtesy or imagination can be called an engineering shop is now so busy making "munitions" of one sort or another, that the difficulty—even supposing you can get your material—is to get an ordinary piece of work done; a machine built, let us say, or a new invention wrought into shape.

So it has become almost part of a consultant's work, in many cases, to cast about among his trade acquaintances to find out where the work can possibly be done, if and supposing other conditions, and the solution of still other problems he is asked to solve.

Most of the new firms—or, rather, old firms contracting for other than their peace-time staples—have naturally got in no new machines other than those which suit their special contract. And no small number of those who formerly undertook general work have got rid of all such machine-tools as merely suited that work, to make room for special plant. It is a mistaken, indeed, a fatal, policy; but there it is.

So the trouble, in the first place, is to find the firm that happens to have retained all their peace-time plant; again, to make sure that it will suit your job, supposing that it can be undertaken at a price, or between contracts.

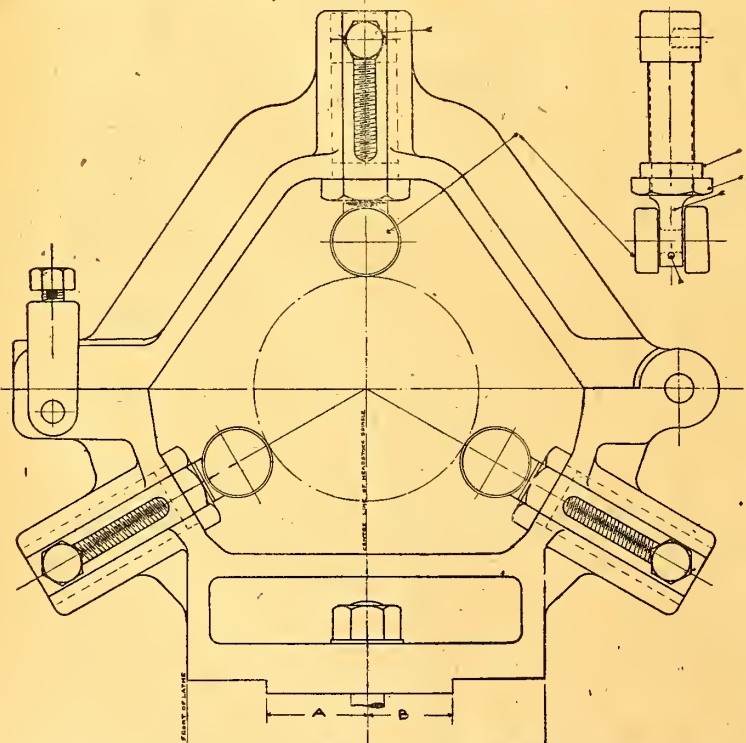
Chiefly, the thing besought is a suitable lathe; and probably after that, the right milling tool. Of the latter, I may say—just to exemplify the difficulty—that I know of but one in London. But since the machine's time, in any case, is the chief factor of cost, it follows that the principle of the heavy cut is and must be the ruling one; heavy as tool-steel and material will stand for.

Consequently, any accessory that assists, much more guarantees this result, becomes an essential accompaniment of the outfit that is to undertake the work.

Such an accessory is the new patent three-point roller lathe-steady recently brought out by the Advance Machinery Co., of 16a Victoria Buildings, Manchester; mainly, in my opinion, because it has been tried to hold the work steady up to the heaviest cutting without the slightest jar on the saddle being discernible; and, secondly, because at the same time re-adjustments can be rapidly made, and frictional losses are minimised.

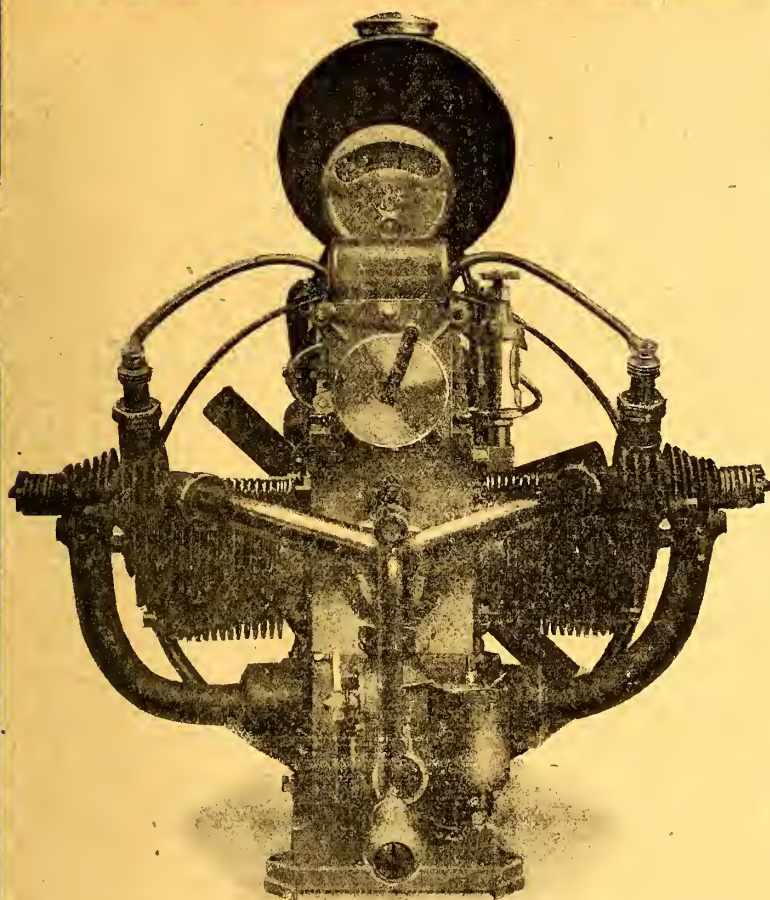
Now the ordinary non-practical spectator, looking at a modern lathe, with its great mass-pieces, and absolute rigidities, nevertheless capable of the most delicate adjustments, automatically maintained, would suppose that the work had merely to be introduced by accurate centring and allowed to run; that the lathe itself would do the rest.

But the worst—or really rather, the best—of the finest lathe ever built is that it will do nothing of the kind. It will do up to, say, ninety per cent., but the rest is to the equation of your skill.



3 POINT PATENT ROLLER LATHE STEADY

obtaining an equal recoil from a charge of "dust-shot" or from a simple gas charge. The theory is very pretty, but the weakness seems to lie in the difficulty of obtaining two charges which exactly balance one another. For example, if the shell be a shade over size it may stick in the barrel and blow the opposite charge



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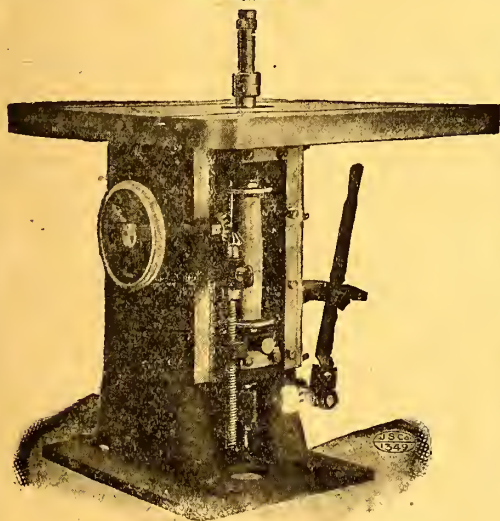
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You may be able to centre the work all right, but you have to hold it steady: and that, so that it will follow through in absolute truth.

It is just here that the need for the most delicate adjustment comes in. You ought to be able to do it by "feel"; which one may best define, by saying that it is—and should be—just that degree of contact between the piece to be machined, and the jaw of the steady which the weight of that jaw would give, if it were enabled to fall freely upon the piece when set up into line.

Yet obviously, with such an arrangement, the difficulty would be to prevent yielding—nullifying the purpose of a steady altogether—as soon as the run began.

So, in the usual type of steady, the jaws are advanced positively by setting bolts behind them. Yet nobody who has ever used a lathe need be told that the mere approach of the jaw to the work by screw threads, let alone its subsequent locking fast, must destroy the sensitiveness and delicacy of the adjustment. So that the mere act of locking fast, however carefully done at each point, must upset anything gained by any attempt at "feel." In fact, all feel is lost thereby, because no man can tell to a few pounds what strength he put into the last two or three setting-home turns of the screw.

Now the body of the Advance steady is quite of the usual construction, with the customary hinged joint and swinging clamp finally locked against the pin of the clamp. But the main difference between it and others, is not only that the jaw elements are fitted with rollers, which naturally give only the most delicate point-contact with the work, but that the elements themselves can be freely slid into approach and contact; and then locked precisely in that position and fine adjustment of "feel," before the actual steadying lock against yield is made.

As will be seen from the illustration, each jaw-element consists of a strut or bar A, on which a locking-nut C is threaded, formed with jaws to carry the rollers on ball-bearings or plain pins. Each is contained within a hole bored through a slotted frame extension formed on the steady body, and is supported by the stud piece D—running into the frame-slot at right angles—which is secured, and subsequently locked by the nut B. So it will be seen that both the element A and the nut B may slide up and down, but cannot rotate, because of the shank of the stud D at right angles to it in the frame piece.

Now in use the nuts B on all three elements are cast free. Then each element is brought up to contact with the work, and as soon as the work is truly centred relatively to the lathe spindle, the adjustment—so far obtained by feel alone—of the two lower elements, is secured by setting home on the nuts B, the whole being finally locked, as to adjustment merely, by likewise setting home on their nuts F. Then the adjustment of the upper element is secured and locked in the same way. Obviously, no setting home on the nuts C, however hard and coarse, can affect this adjustment. But now the work has to be steadied against the cut as strongly as may be. For this purpose, remains then only to set home the nuts C against the steady-body.

So having secured the most delicate adjustment by bare contact, then having locked that contact against interference, and then set that adjustment hard against the cut, the work must follow through in absolute truth.

For the rest, the casting of the Advance steady is of high-grade cast iron free from blow-holes and like defects, and the elements are of strong mild steel, with case-hardened jaws for the rollers, which are likewise case-hardened to prevent wear. This steady is designed to take large bars; and is made in sizes for lathes from 6½ to 24-in. centres. A full series of travelling steadies on the same principle are also, I understand, being manufactured. At any rate, here we have a lathe accessory which, in my opinion, is absolutely essential under present conditions, when experience even more than deftness is at such a premium.

G. DE H.-S.

THE NIEUPORT SCOUT.

The following particulars are taken with acknowledgments from the "Aerial Age Weekly" of New York.

The machine illustrated is of the following dimensions:—

Span, top plane	24 ft. 6 in.
Span, bottom plane	23 ft. 0 in.
Chord, top plane	3 ft. 11 in.
Chord, bottom plane	2 ft. 4 in.
Gap	4 ft. 2 in. to 3 ft. 5 in.
Plane area	145 sq. ft.
Length over all	18 ft. 6 in.
Motor	Le Rhone 80
Propeller	Hélice Levasseur

The trailing edge of upper plane is on a line with that of the lower plane. The upper plane has a greater chord than the lower, and as the leading edge projects about 2 ft. in front of the lower plane, the effect of staggered planes is produced.

Both planes are slightly swept back. The lower has a dihedral of about 8 in., but the upper plane has no dihedral.

The upper plane, in two sections, is joined at the centre of machine. Above the pilot's seat the plane is cut away, so the pilot can easily reach the cockpit, and also making it possible for the pilot to see above, to locate other aircraft.

Wing flaps are recessed in the upper plane, attached to control tubes (indicated on the drawing by short dotted lines), which run through the plane to control arms above the fuselage. Plane covering flaps, over the leading edge of the wing flaps, eliminating the gap usually found where flaps are hinged.

Each section of lower plane is 10 ft. 5 in. in span, set at either side of the fuselage, which is 27 in. wide at this point. Attachment to the fuselage is made at one place, 9 in. from the leading edge, where a 2-in. steel tube 7 ft. in length extends through the plane from the fuselage to the V struts. Around this tube the strut socket is clamped, with cross wire attachments.

The vertical member of the inclined V strut is 3 ft. 6 in. in length; 4 in. wide, with its upper end attached to the rear main spar of upper plane. The inclined member of the strut is 3½ in. wide, attached to the forward main spar of the upper plane. The entire strut is streamline, bound at 12 in. intervals with silk ribbon. Upper ends of strut are 34 in. apart. Struts from the fuselage are oval steel tube, 20 in. long. Where they connect with fuselage, they are 30 in. from front to rear struts.

The usual girder box construction is employed, with sides and bottom flat, and the top following the curve of the motor cowl, which is 40 in. in diameter. Vertical members are light T section. Covering back of the pilot's seat is linen, and forward of this 3-ply veneer is used.

The seat is a few inches from the fuselage bottom, and the wide cockpit allows for free movement of the arms. At the seat the fuselage is 33 in. deep and 32 in. wide, tapering to 12 in. high, where the rudder is attached. Where the leading edge of tail plane attaches to the fuselage, the fuselage top is 8 in. wide.

The non-lifting tail plane is 17 in. wide. Tail flaps are 22 in. wide. The distance from tip to tip of the tail flaps is 10 ft. 7 in. At the trailing edge of the tail plane a steel tube is hinged, and to this the flaps are attached. There is a space of 9 in. between flaps. The tail plane is supported by steel braces running up from the lower end of the fuselage termination.

A steel tube runs through the rudder and hinges to the fuselage, operated by a short lever arm.

V type landing chassis is used, with a steel axle sprung on rubber shock absorbers. Two 26-in. wheels are spaced 5 ft. 4 in. apart. Streamline landing members are 4 in. wide, 1 in. thick, with heavy cross bracing cable between. The tops of rear skid struts are placed 30 in. back of the forward skid struts.

Tail skid is provided with a streamline shield of veneer, as shown on the drawing. The skid itself is ash with a steel plate extension

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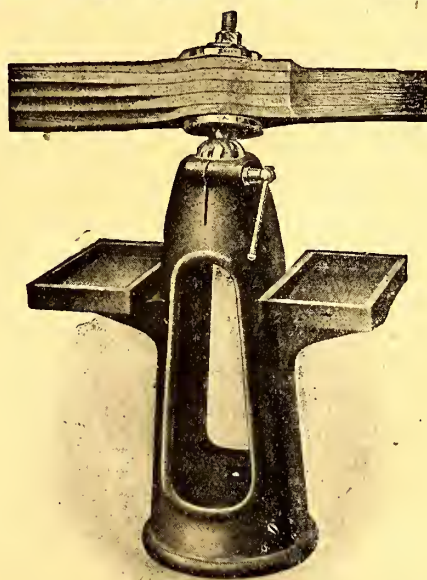


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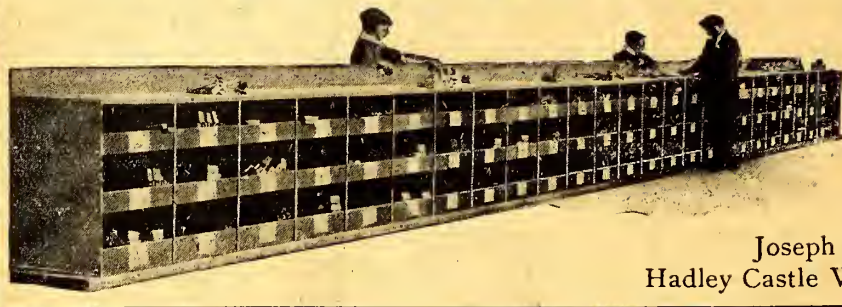
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which comes in contact with the ground. The skid raises the end of the fuselage 13 in. from the ground when at rest.

Standard control is used; a single lever in the centre of the cockpit, and a pivoted foot bar for the rudder. Forward and

NICKEL-STEEL: ITS VALUE IN AEROPLANE CONSTRUCTION.

WRITTEN AND ILLUSTRATED BY JAMES SCOTT.

Nickel is added to steel for the purpose of hardening it, and thus rendering it more durable, and capable of withstanding the constant stresses to which it is habitually submitted.

The alloy which I examined in connection with this article was produced by one of the firms whose advertisement appears in this journal, and is adapted for use as connecting rods in aeroplanes.

The sample is tubular, one inch in diameter, and of No. 11 gauge; and is annealed. The breaking stress is 43.8 tons per square inch; and the yield stress 38.1 tons per square inch; and the elongation 21 per cent. in two inches. These technical details will, of course, only be appreciated by those people who have sufficient knowledge to realise their significance. More attractive phases of the subject can be obtained from microscopical inspection.

Annealing means that the metal has been kept for a certain period at a constant, and suitable, temperature. In such a case the individual granules coalesce together more satisfactorily, and thereby provide a reliable product.

Metals are capable of crystallising as they solidify from the molten condition, and subsequently cool. If a single element is concerned it may develop specific forms on a small scale; but owing to the compactness of all the contents, it is seldom that perfect crystals are obtained.

Some portions, particularly the outside of a mass, solidify first, and press inwardly into the remainder, consequently hindering complete resolution into crystals; but the separated granules will often show some indication of their inherent disposition; some metals being more pronounced in this respect than others. The practical result is the formation of amalgamated granules, some of which are really devoid of any symmetry, while others exhibit angular facets indicative of an attempt at crystallisation.

When two metallic elements are melted together complications begin to occur. According to the respective proportions so follows their conduct; the variations of which depend on the chances afforded them of becoming quite intimate, or otherwise. With a given percentage of one component, say, this is dissolved in the other so that the product is really a new substance or granular mixture, without the features of either of the original ones. Such a compound is called an entectic.

Increase the amount of an element, and the excess of this tends to separate as crystals, while the remainder fills up the spaces between these hardening particles. It is not always necessary for the quantity of the separating metal to be greater than that of the other—indeed the reverse is frequently the case.

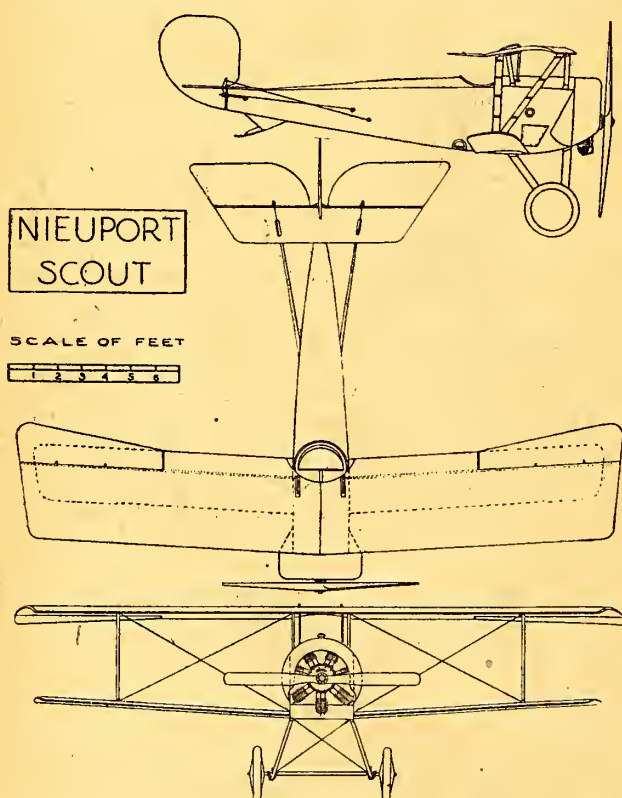
The melting points of metals differ. The entectic, however, is favoured by uniformity of fluidity.

It follows, therefore, that one (when free) must become liquid before the other. In freezing, or solidifying, from the molten state the opposite course must happen, that which requires less heat to soften hardening first. But the melting points of combinations may differ from that of the original constituents.

It is upon the skill and experience of the metal worker that success in the manufacture of such products depends. The writer can only give general ideas on the matter; but it is hoped that they will be understandable.

Although the percentage of nickel in a nickel-steel is considerably less than that of the iron, the latter really dissolves in the former, if the compound has been rightly prepared. It must be borne in mind that crystals and granules "grow." No other word adequately defines the actions.

We have, first, a molten mixture. In the solidifying areas the forming particles increase in individual sizes until they are so tightly pressed side by side that there is no room between them to allow for further expansion. They, therefore, lengthen in the direction of least resistance, often producing beautiful tree-like



backward movement of the lever turns the tail flaps down or up. Movement of the lever from side to side works the wing flaps. This side to side movement is arranged in such a way that it can also be operated by the feet, by means of a foot bar which is entirely separate from the rudder foot bar. From each end of the wing flap foot bar a 1-in. oval tube bar runs up through the fuselage to a lever attached to the tube in the upper plane to which the flaps are connected. In the upper plane, rectangular openings are provided to accommodate the above-mentioned lever.

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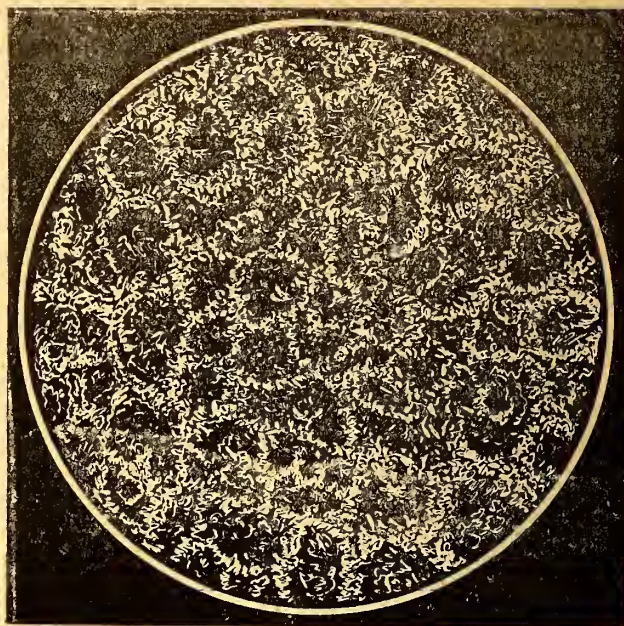
extensions, the interstices of which, however, soon get crammed with the remainder of the stiffening metal.

Movements of the particles occur while the solid mass is cooling; but they are confined principally to spreading, or slipping into gas-holes, or tiny crevices due to unequal settlement. Granules in this mass may get covered with projections; which press in all directions through the surrounding heap. All kinds of formations can be traced; but annealing is designed to resoften these irregularities, and to render the various ingredients more homogeneous, and better arranged. The particles are really remodelled, and thoroughly welded together.

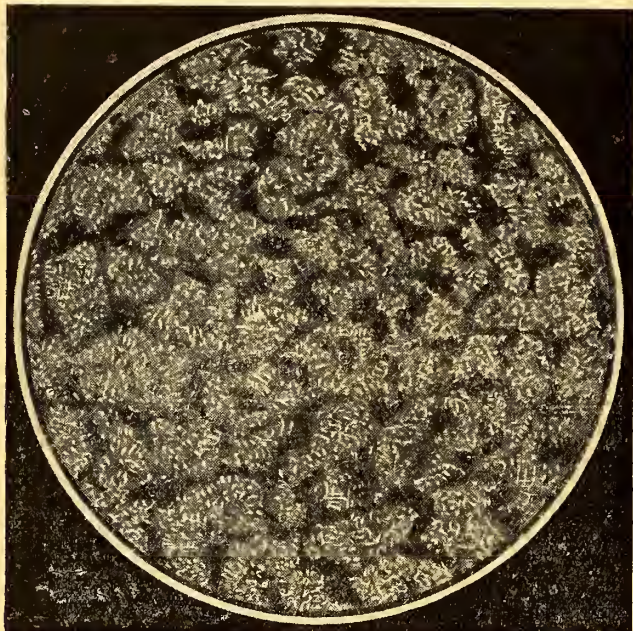
There is practically no limit to the modifications possible among the minute granules of an alloy; although the behaviours of different kinds are very characteristic. Some crack across and eventually split up smaller; some close up with their companions so that the union yields larger ones; some of harder calibre press into those which are softer; and some run between their neighbours, and link up like a network.

These, and kindred alterations, can take place in a metal after it has been manufactured into commercial goods; although apparently the whole of the metal continues in its original state.

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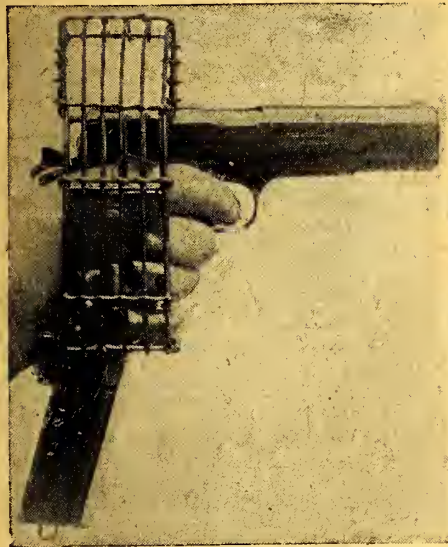
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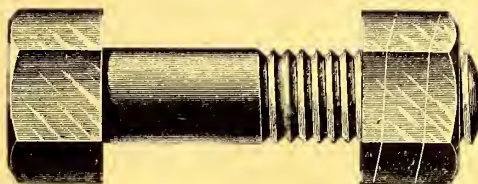
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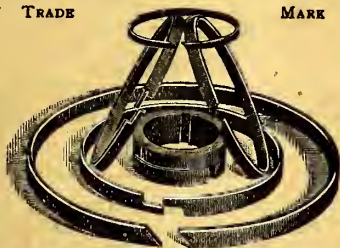
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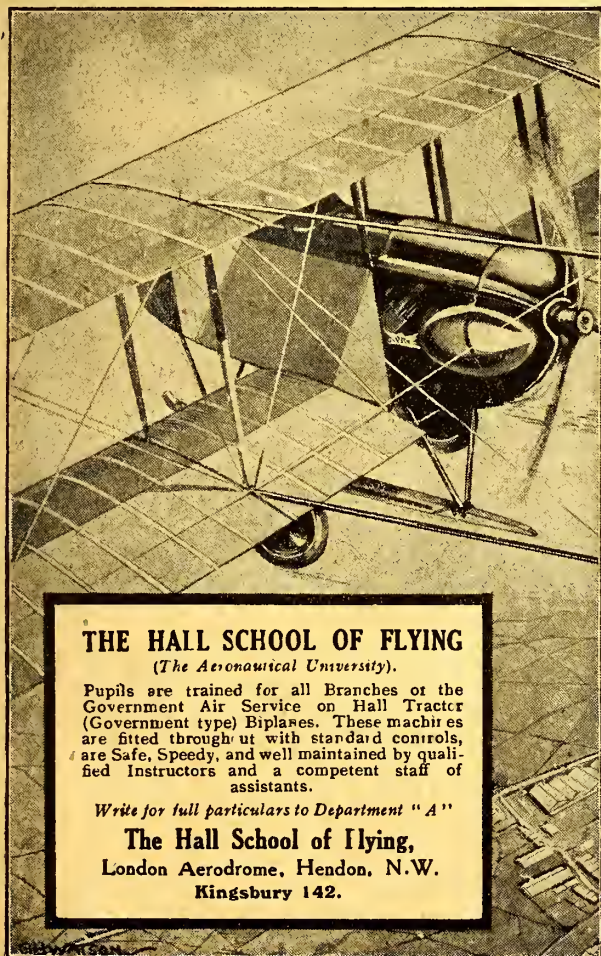
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The AEROPLANE

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ON AIRSHIPS AND AEROPLANES.

Possibly it may strike some people as peculiar that a paper which calls itself *THE AEROPLANE* should devote a whole issue—and something of a special issue at that—to the subject of airships. The reasons are fairly obvious to those who think, but as most people do not think, it may be well to explain that, barring the fact that it floats instead of flies, in the proper sense of the word, an airship is subject to all the aerodynamic troubles of an aeroplane. It is controlled vertically and directionally by planes operating on the air, and its stability depends on precisely the same physical laws as does the stability of an aeroplane fuselage. If you have ever seen an airship try to "spiu" you would realise it thoroughly. In fact the hull of an airship is merely an aeroplane fuselage which lifts itself, instead of being lifted by wings.

All the other problems of airship designers, such as propellers, engines, head-resistance, side-areas, and even constructional details—especially if one believes the official deduction that there is a scarcity of aluminium in Germany, and that wood must therefore be largely used in German airship construction—are exactly similar to the problems which worry aeroplane designers.

Aeroplane designers, with their vastly greater experience of detail work, can be a very great help to airship designers, for it is well to remember that the aeroplane has had many more generations of development than the airship. The latest Zeppelin is probably not more than the fifteenth actual distinct step in development from the first ship of its kind, and apparently its development has suffered from in-breeding. That is to say, each generation has been almost pure Zeppelin, and it is only of late, since the Schütte-Lanz cross has been introduced into the strain, that any notable improvement is evident.

The aeroplane of to-day is probably nearer its fifteen-hundredth generation than its fifteenth, which accounts for its general design and its detail being so highly developed. Moreover, the modern aeroplane is most promiscuously bred. The ideas of one designer crop up in another designer's aeroplanes in a way which lead to grievous doubts about the real parentage of the machines, and one finds interesting cases of atavism in the most modern and highly developed products.

For instance, one sees a modern wing-curve, announced as a great discovery, with a distinct "Phillips entry," and another with a very strong resemblance to the earliest Deperdussin "sky-hook." The Avro triplane, which died in 1910 or so, or at least 50 generations ago in its own family, turns up again in other peoples' families, and nothing would surprise me less than to see Mr. Horatio Phillips' almost prehistoric "venetian blind" idea appear as a novelty, crossed with a part of Mr. José Weiss's wing curve. If you look at some of the much-advertised R.A.F. wing-curves you will find a still quainter case of atavism, for the lower half of them throws back to the elementary flat plane, which is the most primitive of all aero-foils—in fact the only true "plane." One could write quite a nice little essay on how the Government's stipendiary

geniuses humbugged themselves, and half the Aircraft Industry, into believing in the flat-bottomed plane, forgetting the practical point that the saving of head-resistance, or the lift-drift ratio of a wing, is not the be-all and end-all of aeroplane design, and that there may be something to be said for the "sky-hook" after all. Aeroplane designers are advised to inquire of the Board of Invention and Research rather than of the National Physical Laboratory for further information on this subject, which is really rather amusing. To discuss it further here might convey information to the enemy.

Fuselages, engine-bearers, and all sorts of fittings have developed at a corresponding rate, which is why aeroplane design is so far in front of airship design, wherever the two diverge enough for airship details to be entirely in the hands of men who are without aeroplane experience.

The zoological parallel is rather that of the mammoth and the dog. The mammoth, breeding once in ten years or so, and running a hundred years or more to the generation, has developed no further than the elephant, who is an unfinished sort of job at his best, whereas the dog, breeding two or three times a year, and averaging about seven or eight years to the generation, is a very highly developed animal, and is, incidentally, capable of scaring the life out of an elephant.

Quite *en passant* one may remark that many æons of development do not seem to have produced any marked moral advance in the human animal, for the concurrent savagery and heroism of the present war prove beyond dispute that man has not altered since prehistoric days, and that the thing which we call civilisation is merely a thin veneer with a few accessories such as aeroplanes and telephones and churches on top of it. The animal is the basis of the structure, just as one finds common wood inside a veneered and inlaid table laden with costly and useless and frequently unornamental bric-à-brac—"objects of bigotry and virtue," as a certain Mrs. Malaprop called them.

OTHER REASONS.

Another very good reason for dealing extensively with airships in *THE AEROPLANE* is that it is well for the younger generation of aviators, and of airship pilots also, to know something of the early efforts of airship constructors, for it is characteristic of those who come into a new game or a new science or a new industry on the crest of a boom to think that they created the game, science, or industry in question, whereas they are in fact themselves the creations of the boom, and are very often merely the froth on the crest of the wave. Hence it will be well for some of the luftschiffer quirkers to realise that quite big airships were built between ten and fifteen years ago, and that highly satisfactory voyages were made so far back as eight years ago, when they were in knicker-bockers, and that the older hands are worthy of due respect accordingly.

There is also the reason that aeroplane pilots and gunners, who are the natural enemies of all airships, ought to

know something about the earlier types of their victims. The more the big-game hunter knows about the anatomy of his quarry the more likely he is to achieve results satisfactory to himself. The manners and customs of the animal he wishes to kill are of the highest interest to him, and by studying their habits the slayer of beasts frequently comes to love his enemies. So, one imagines, it may be with aeroplane pilots, and I can only hope that such information as is contained in this issue of THE AEROPLANE may assist aeroplaneists in their pursuit of knowledge about airships.

It is not claimed that the covers of this paper contain all there is to know about airships, either historically or technically, but one can safely say that never hitherto has as comprehensive a collection of airship pictures been published inside one cover, and to that extent readers of this paper are afforded an unrivalled opportunity for the comparison of different types of ships, and for the comparison of all with the very latest German ships.

THE FUTURE OF AIRSHIPS.

Naturally the question uppermost in the minds of all concerned with aeronautics is—"What is the future of the airship?"

As a believer from the beginning of flying in the dominance of the aeroplane, I am the last person to attribute unduly high value to the airship. The aeroplane must always be faster. Hitherto the aeroplane speed record has been almost uniformly twice that of the airship. To-day the fastest airship certainly does not exceed 70 miles an hour, and the fastest aeroplane does as near 140 miles an hour as no matter.

Likewise the aeroplane height record has always been about double the airship height record. Before the war the airship's best was between 10,000 and 12,000 feet, specially faked for the job, and the aeroplane record was 25,750 feet—made in Germany and undeniably authentic. To-day a modern Zeppelin might reach 15,000 feet, and the aeroplane record certainly exceeds the 26,000 feet approached before the war.

Given this superiority in speed and climb, and considering the higher vulnerability of the airship, the aeroplane must always be superior in the offensive-defensive. That is to say, the short-range high-speed aeroplane, properly equipped, can always defend its country against invading airships.

Where the airship scores is in its distance and duration possibilities, and especially where work over the sea is concerned.

An aeroplane helped by the wind may travel farther. Multiple-engined aeroplanes with improved motors may

be guaranteed not to descend owing to engine failure. Inherently stable aeroplanes may fly without fear of accident—other than collision—in a thick fog. But no aeroplane will ever be able to shut off its engines and simply drift about and listen as an airship can do.

Given properly gas-tight gas-bags, an airship can keep in the air for days at a time and save its fuel till it is wanted, whereas an aeroplane is using up fuel, at an astonishing rate, every minute it is in the air. It is on this one point of duration that the airship utterly defeats the aeroplane, and must always defeat it.

Therefore, as a scout in war where it is unlikely to be harassed by enemy aeroplanes the airship is of the highest value. To-day over the North Sea Germany's airships are doing very great work. To-day we could use our little airships for frontier patrols in India and Africa, instead of sending gallant lads out on aeroplanes over country where engine failure means almost certain death. We do actually use our little ships with some effect as submarine scouts, but there is plenty of other use for them if we took the trouble to develop them.

OUR NEED FOR AIRSHIPS.

The nation which holds the command of the air by means of its aeroplanes is therefore the nation which has the greatest use for airships. Just as the Allies can use kite-balloons in France because their aeroplanes protect them against hostile aircraft, so we can use airships if we have aeroplanes to protect them. A big airship carrying a few tons of bombs can hold itself absolutely still over the place to be bombed, and do its work accurately, and it will be able to do so in broad daylight when airships are so developed as to enable them to reach higher altitudes where they may be reasonably safe from anti-aircraft guns, and when their safety against hostile aircraft can be guaranteed by a superior aeroplane fleet.

Thus we see that when we obtain absolute command of the air by means of our aeroplanes we can find greater uses for our airships, and, further, that we may then find it better worth our while to build airships.

Then we may find out the uses of airships as passenger vehicles, especially over long stretches of sea, and here will come in the commercial future of the airship.

It is hoped that this expression of opinion may not bring forth the wrath of all airship engineers, and that it may help to encourage those who are concerned, without any particular enthusiasm, in the construction of airships.

C. G. G.

THE AERONAUTICAL SOCIETY AND THE S.B.A.C.

It is stated that the Council of the Aeronautical Society has decided to recognise the Society of British Aircraft Constructors as the accredited body representing the Aircraft Industry.

Readers of this paper may recollect that some months ago the Society of Motor Manufacturers and Traders registered an offshoot of itself under a somewhat high-sounding title—which the present writer has omitted to remember—seemingly with the intention of enrolling therein newcomers to the Aircraft Industry, and eventually bringing the Industry under the wing of the S.M.M. & T.

The S.B.A.C., on the other hand, acquired first the support of all the purely aircraft firms and then proceeded to enrol a number of firms who are more or less concerned with motor-mongering. The natural result was that the S.M.M. & T. offshoot found itself competing with the S.B.A.C. for recognition as the representative body of the Aircraft Industry.

One gathers that both bodies approached the Aeronautical Society, as the oldest scientific society of its kind in the world, and asked for its paternal blessing, as it were. There was, it seems, much debate in the Society's Council as to the claims of the two bodies, the representative of a big motor concern, which runs aeroplanes as a side-line, arguing at great length in favour of the S.M.M. & T.'s side-line, and a bona fide aeroplane manufacturer putting up solid argument in favour of the bona fide aircraft organisation. Finally the Council sensibly decided that

being an aeronautical society, and not a motor-oracle society (or whatever the correct adjective may be), the Society should ally itself with the body whose interests were wholly concerned with aircraft, and proceeded to give its official recognition to the S.B.A.C.

One presumes that the Royal Aero Club will proceed to recognise the S.B.A.C. officially also.

It seems that the argument, which was obviously bound to arise sooner or later, was brought to a head by that ever-fruitle source of dispute, the Motor Show bonds. For the benefit of those uninitiated in sordid trade matters it may be well to explain that the S.M.M. & T. is the body which holds motor shows at Olympia in time of peace. Exhibitors are asked to sign bonds agreeing under penalty not to exhibit at any show held by any other society. Signatories to these bonds have first choice of positions at the show. Those who refuse to sign are in consequence more or less frozen out.

Apparently Peace is thought by some people to be so near breaking out that shows are already being discussed again, and, in signing bonds concerning future motor shows, certain firms who build aircraft as well as automobiles, have refused to bind themselves as regards aircraft for the sake of the motor side of their businesses. That is to say they desire to be free to exhibit at any show which may be held by the Aircraft Industry for the benefit of the Aircraft Industry. Hitherto the Aero Shows at Olympia have been run by the S.M.M. & T., and I believe they have been run at a loss. If so the blame must be divided between

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the apathy of the British Public and the ineptitude of the S.M.M. & T.'s advertising, for nothing less attractive than the Aero Show posters has ever been seen on a hoarding. Anyhow, having lost a trifle on aero shows out of the many thousands made out of motor shows, one is led to believe that the S.M.M. & T. thinks that it has established a prescriptive right to the holding of all future Aero Shows. Hence the clause in the bond which practically says that if a firm exhibits aeroplanes without the gracious permission of the S.M.M. & T. its motor cars shall be excommunicated for ever after.

If the S.M.M. & T. had ever done anything for aviation, beyond indulging in speculative attempts to make money out of aero shows, one might sympathise with its ambition to corner the aero show business and to rake the Aircraft Industry in as an appendage to the motor business. But unfortunately it has not.

The S.M.M. & T. might have done much to encourage aviation. Out of its huge Olympia profits it might have offered handsome prizes for aeroplane and aero-engine competitions calculated to improve the breed. It could have afforded to give space free to exhibitors of aircraft at Olympia. With the vast political influence it could wield if it tried it could have brought pressure to bear in Parliament in favour of British aeroplane and aero-engine makers at a time when the Government was trying to corner aviation and making its own stuff or buying it abroad instead of supporting British industry. Instead, it did nothing, except perhaps bewail its trifling losses over the Aero Shows. It had an "Aero Section," which only seemed to have any existence when it was necessary to entertain notabilities at the Shows.

There the S.M.M. & T.'s interest in aviation in the past seems to have ceased, so far as one can discover. I have yet to meet any aircraft constructor who owes the S.M.M. & T. anything for pre-war help. Therefore one fails to see how any off-shoot of the S.M.M. & T. can claim to represent the Aircraft Industry as against a body like the S.B.A.C., which was founded by firms exclusively engaged in the Aircraft Industry.

If the S.M.M. & T. likes to have an Aero Section concerned with aero-motors, well and good. That would be legitimately within its sphere of influence, and such a section working amicably with the S.B.A.C. might serve quite a useful purpose in life, but the Aircraft Industry is not in the least likely to knuckle under and admit itself to be a poor relation of the Motor Trade or to hold its shows on sufferance.

If the S.M.M. & T. is wise it will renounce all attempts to corner the aero show business and all its aspirations to control the Aircraft Industry. It has plenty to do in looking after its own business, and it does not strike one as doing even that superlatively well. Let it ponder the fable of the frog which swelled itself out till it burst. The Aircraft Industry is going to be far too great a thing for the S.M.M. & T. and its shop-keeping interests to handle. Aircraft are the only vehicles which can range in size all the way from a bath-chair to a battleship. If the little sporting aeroplane of 50 to 100 h.p. were to be the limit in size one could admit the S.M.M. & T.'s pretensions, but where would a motor-shop be in building a super-Zeppelin? That is a ship-builder's job. Therefore one advises the S.M.M. & T. to keep its hands off the Aircraft Industry and the S.B.A.C. The Aircraft Industry will come and buy things in the Motor Trade's Shop when it feels so disposed, and the two may be on quite civil terms, as becomes customer and tradesman. They may even have interests in one another's businesses in a friendly way, but the two things are wide apart, and are better kept so.—C. G. G.

THE R.N.A.S. COMFORTS FUND.

An Appeal to all Readers of "The Aeroplane."

The R.N.A.S. Comforts Fund has now been registered under the special provisions which prescribe the registration of all Funds appealing for public subscriptions.

The R.N.A.S. Comforts Fund was founded by Mrs. Sueter, wife of Commodore Murray F. Sueter, C.B., R.N., Superintendent of Aircraft Construction, in October, 1914. Since its formation a large sum of money has been collected, almost a matter of £2,000, and this has been wisely spent in the provision of articles wanted by the men and petty officers in the R.N.A.S.

In addition to the money collected an almost endless supply of ready-made garments of all kinds has been received and dispatched, and all this has been done with the smallest possible cost of administration. Incidentally, Mrs. Sueter has not only done the greater portion of the work of collection and distribution herself, but she has spent a considerable sum out of her own pocket on the Fund.

The men of the R.N.A.S. have shown their appreciation of the thoughtfulness of the subscribers to the Comforts Fund in many letters of hearty thanks, and it is to be hoped that in the future the Fund will be still better supported than in the past.

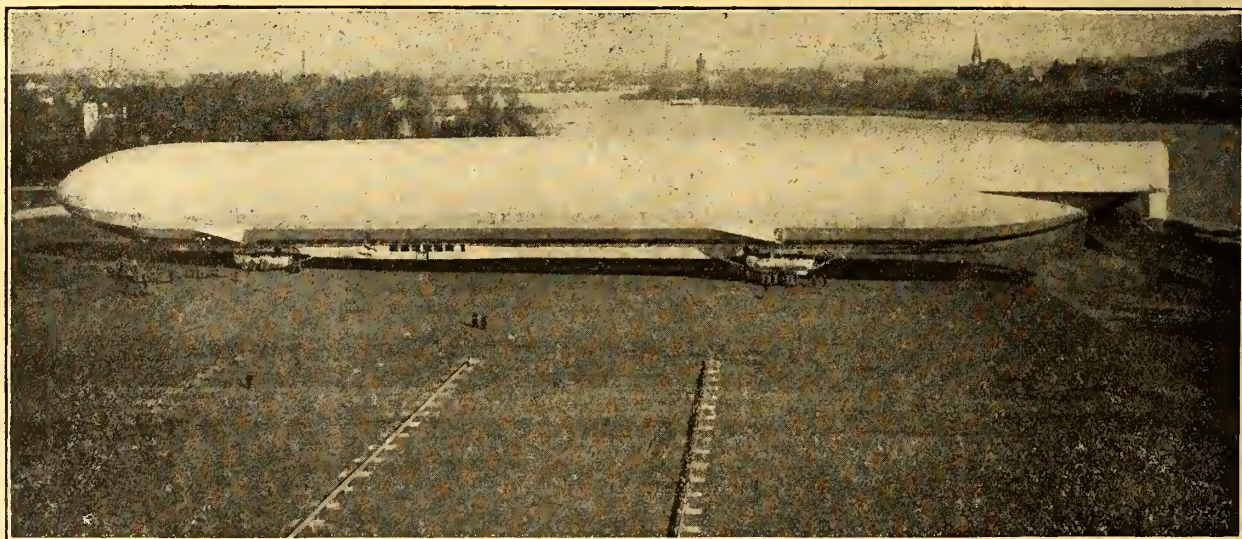
In the early days of the war a number of aircraft firms made it a custom to send regular contributions to the Fund collected by their employees. Unfortunately, in many instances this custom has lapsed, and it is suggested that the employees of the older aircraft firms, and also those of the newer firms, should re-open the practice as an acknowledgment of the self-sacrifice of those who are enduring all kinds of discomfort on the sea and at weather-beaten air stations for the benefit of those at home. Aircraft workers, in common with munition workers in general, are earning more than they ever made in their lives before, and most of them can well spare a trifle for this very laudable purpose. Of course, it is fully recognised that munition work is extremely hard, and that the hours are very long, but those engaged in it do not suffer one-tenth the discomfort of the ratings of the R.N.A.S., who are frequently on duty for 36 hours at a time under most trying circumstances, and anything that can assist their creature comfort in the way of extra garments, or to add recreation in such leisure hours that are available, is only a gracious acknowledgment on the part of the more fortunate people whose work keeps them at home.

It is suggested that shop foremen should organise a weekly collection, either by the use of a collection box or else by the agreement of a flat rate. It is probable that any effort made by the workshop hands in this direction would be taken up with additional enthusiasm if the directors agreed to subscribe an additional amount proportionate to that contributed by the shops.

As regards the committee which has been established for statutory purposes, its constitution is as follows:—

Mrs. Sueter (Chairman and Hon. Treasurer).
Mrs. Groves.
Mrs. Henry Balfour.
Mrs. Samson.
Mrs. Mackworth.
Mrs. Ireland (Hon. Secretary).

The following contribution is acknowledged from Mrs. R. Sebag-Montefiore, £1 1s. Total to date, £1,961 9s. 7d. Contributions in cash and kind should be sent to Mrs. Sueter, The Howe, Watlington, Oxon.



One of the later Passenger Zeppelins photographed from its shed, and showing the rails to which it is anchored to hold it steady while being housed.

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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Oct. 24th, 1916.

ADMIRALTY, Oct. 20th.

R.N.V.R.—To be temp. Lt.: Flt. Sub-Lt. Norman C. Blanch, Mar. 6th, 1916.

WAR OFFICE, Oct. 24th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Squad. Comdrs.—From Flt. Comdrs. And to be temp. Majors whilst so empled:—Lt. (temp. Capt.) G. L. P. Henderson, Spec. Res.; Lt. (temp. Capt.) A. C. Wright, Spec. Res., Oct. 1st.

Staff Officer, 2nd Cl. (graded for pay as a Brig. Maj.).—Temp. Capt. F. R. Hedges, Gen. List, from an Adj., Oct. 7th.

Asst. Experimental Officer (graded as an Equipment Officer, 3rd Cl.).—Temp. Lt. H. L. Billinton, Lan. Fus., and to be transf'd. to Gen. List, Aug. 15th.

Equipment Officers, 3rd Cl.—Temp. Sec. Lt. G. S. Steel, Gen. List, Sept. 18th. Temp. Sec. Lt. L. Norris, Gen. List, temp. Sec. Lt. J. B. Waddoup, Gen. List, Sept. 22nd. Sec. Lt. (on prob.) R. Donald, Spec. Res.; Sec. Lt. (on prob.) S. S. Kaye, Spec. Res.; Sec. Lt. J. D. Campion, Spec. Res., Oct. 5th.

ROYAL REGIMENT OF ARTILLERY.—R.H. AND R.F.A.—Temp. Lt. F. A. Brock relinquishes his commn. on appt. to R.N.A.S., Oct. 24th, 1914.

MEMORANDA.—Sec. Lt. (on prob.) E. G. C. Quilter, from R.F.C., Spec. Res., to be temp. Sec. Lt. on Gen. List for duty with R.F.C., July 18th.

To be temp. Sec. Lts., for duty with R.F.C.:—2nd Cl. Air Mech. E. H. Channon, from R.N.A.S.; 1st Cl. Air Mech. R. G. C. Pinfield, from R.N.A.S.; 2nd Cl. Air Mech. H. W. Ingram, from R.N.A.S., Sept. 9th.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Co. Qmr.-Sgt. T. Allen, from Bord. R., T.F., Sept. 3rd. Qmr.-Sgt. J. W. Jennings, Sept. 10th.

Cdts. to be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—C. E. Tebbs, C. H. Simpson, R. W. Atchley, H. Haddon, J. C. Courtey, R. L. Cobb, H. Stansfield, K. A. Smith, L. L. W. Smythe, F. Ward, Sept. 10th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Following resign their commns.:—Sec. Lt. W. A. Spratt, Sec. Lt. (on prob.) C. A. Mader, Oct. 25th.

To be Sec. Lts. (on prob.):—R. Donald, Aug. 31st. L. M. Archibald, Oct. 6th. H. Wilson, Oct. 8th. F. H. Tyas, Oct. 9th.

TERRITORIAL FORCE.—YEOMANRY.—N. MID. DIV. CYCLIST CO.—Sec. Lt. A. Winks is sec'd. for duty with the R.F.C., Oct. 9th.

R. 1ST DEVON.—Lt. (temp. Capt.) R. E. C. Knight-Bruce is sec'd. for duty with the R.F.C., Sept. 6th.

1ST LOVAT'S SCOUTS.—Sec. Lt. (temp. Lt.) C. Dunlop is sec'd. for service with the R.F.C., Oct. 10th.

R.G.A.—CORNWALL.—The following officers are sec'd. for Anti-Aircraft duties:—Lts. (temp. Capts.) W. V. G. Hancock and R. H. Read; Sec. Lts. (temp. Capts.) R. C. Moore and H. E. Harker; Sec. Lts. (temp. Lts.) W. H. Moffatt, G. A. Hicks, and S. T. Butlin; Sec. Lts. E. W. Cuff, H. G. Fitzherbert, E. H. Ashby, G. N. Bacon, R. H. Stephens, F. T. Mills, J. C. T. Craze, G. H. Bickford, J. C. Daniell, W. A. Edwards, C. R. Pengelly, P. H. Lindley, and G. G. Vawdrey, Oct. 20th.

DEVON.—The following officers are sec'd. for Anti-Aircraft duties:—Capt. E. S. Rogers, Sec. Lt. (temp. Capt.) W. Eadie, Sec. Lts. (temp. Lts.) N. E. Hogge, W. Leithbridge, J. Forster, A. E. Nichols, and G. E. Fowler; Sec. Lts. W. H. Tidbald, H. B. Davidson, W. E. Stoneman, W. H. Miers, W. E. C. Hope, C. B. Spencer, J. Woolland, C. N. B. Willey, and E. F. Cliff, Oct. 20th.

DORSET.—The following officers are sec'd. for Anti-Aircraft duties:—Sec. Lts. A. C. Armstrong and D. A. West, Oct. 20th.

DURHAM.—The following officers are sec'd. for Anti-Aircraft duties:—Capt. (temp. Maj.) E. Barraclough, Capt. T. R. King, Lt. R. P. Hart; Sec. Lts. F. W. Carey, J. A. Lee, and J. Giers, Oct. 20th.

ESSEX AND SUFFOLK.—The following officers are sec'd. for Anti-Aircraft duties:—Maj. C. Lloyd, Capt. (temp. Maj.) A. Biddell, Lt. (temp. Capt.) E. G. Simmons, Sec. Lt. (temp. Capt.) H. G. Hepworth, Sec. Lts. (temp. Lts.) N. C. Newby, B. L. Garrad, H. A. Newton, and H. Vickers; Sec. Lts. J. D. Young, C. W. Barber, A. H. Hall, T. R. Holmes, C. E. Denny, B. H. Paul, A. J. C. Tucker, C. N. Brown, Oct. 20th.

GLAMORGAN.—The following officers are sec'd. for Anti-Aircraft duties:—Sec. Lt. (temp. Lt.) E. R. Nicholls, Sec. Lts. R. D. Nicholls, R. G. Phillips, and W. I. I'ring, Oct. 20th.

HAMPSHIRE.—The following officers are sec'd. for Anti-Aircraft duties:—Capt. (temp. Maj.) E. D. R. Jacob, Capt. B. M. Arnold, Lt. (temp. Capt.) W. E. Dittman, Capt. H. A. B. Storry, Capt. E. E. Solomon, Sec. Lts. (temp. Capts.) H. B. Cox and T. S. Hewitt; Lt. S. E. Gudgeon; Sec. Lts. (temp. Lts.) R. H. Green, A. S. MacLachlin, E. A. Fisher, G. R. Davis, L. V. Donne, A. V. Treacher, H. J. Whitehouse, A. Ferguson, J. V. R. Jacob,

C. W. S. Hay, W. A. J. Mitchell, and J. G. Lack; Sec. Lts. L. C. Gordon, R. L. Mann, S. W. Brill, S. F. Kneller, H. I. Hardy, S. A. Mumford, H. C. Tomkins, J. C. Cox, A. J. Fisher, A. B. Stevens, R. F. Dixon, and S. W. Dennett, Oct. 20th.

KENT.—The following officers are sec'd. for Anti-Aircraft duties:—Lt. (temp. Maj.) C. Buckle; Capt. (temp. Maj.) E. J. Goldsmith; Capt. W. E. B. Gadd; Lts. (temp. Capts.) F. D. Pearce and R. Godfrey; Sec. Lt. (temp. Capt.) E. P. Warlters; Sec. Lts. (temp. Lts.) S. T. Box, L. Steel, J. Banks, K. E. May, H. S. Picking, T. F. Ellison, and E. Browne; Sec. Lts. F. L. Haigh, G. H. Baxter, R. G. Whitaker, W. J. Whittaker, P. R. Wallis, J. L. N. Flint, P. E. B. Fooks, H. B. Jennings, Oct. 20th.

E. RIDING.—The following officers are sec'd. for Anti-Aircraft duties:—Lts. (temp. Capts.) E. L. Robson, J. H. Fenner, H. Easton, Sec. Lt. (temp. Capt.) J. P. Sargent, Sec. Lt. (temp. Lt. K. Hall, Sec. Lts. E. R. Bickersteth, T. G. Leonard, T. E. Locking, D. D. M. Bonar, G. Holdsworth, E. K. Locking, A. D. Carnichael, D. E. Cromarty, W. J. Slater, J. H. Watson, L. S. N. Lewendon, M. Patton, H. D. Clarke, D. F. W. Scanlan, J. F. B. Johnson, F. Pearson, H. Middlewood, W. B. Brittain, and W. L. Hirst, Oct. 20th.

INFANTRY.—BEDFORD R.—Sec. Lt. (temp. Lt.) A. H. Orlebar is sec'd. for duty with R.F.C., Sept. 17th.

ARMY SERVICE CORPS.—W. LANCs. DIVL. TRAIN.—Sec. Lt. (temp. Lt.) E. C. Lansdale is now sec'd. for duty with the R.F.C., Sept. 18th.

* * *

From the "London Gazette" Supplement, Oct. 25th, 1916.

ADMIRALTY, Oct. 25th.

The King has been pleased to give orders for the appointment of the following to be a Companion of the Distinguished Service Order:—

Flt. Lt. COLIN ROY MACKENZIE, R.N.A.S.

In recognition of his skill and gallantry in destroying a German kite balloon on Sept. 7th, 1916, under very severe anti-aircraft fire.

The King has also been pleased to approve of the award of the Distinguished Service Cross to the following:—

Flt. Comdr. TOM HARRY ENGLAND, R.N.A.S.

In recognition of his services on Aug. 26th, 1916, when, accompanied by a military officer as observer, he flew a seaplane 43 miles inland from the Syrian Coast, crossed a range of hills 2,000 feet high, with clouds at 1,500 feet, and after dropping bombs on the station of Homs returned safely to his ship. The machine was exposed to rifle fire at extremely low altitudes for long periods, and Flt. Comdr. England showed remarkable pluck, determination, and skill in carrying out the flight under adverse conditions.

Flt. Lt. CHARLES TEVERILL FREEMAN, R.N.A.S.

In recognition of the gallantry and skill displayed by him on the night of Aug. 2nd, 1916, when he made a determined attack on a Zeppelin at sea, only abandoning the attack when he had exhausted all his ammunition. As darkness was approaching at the time, and his chances of being picked up were problematical, his courage and devotion in returning to the attack a second and third time were exemplary.

Flt. Sub-Lt. STANLEY JAMES GOBLE, R.N.A.S.

In recognition of his services on Sept. 24th, 1916, when he attacked two hostile machines in the vicinity of Ghisteltes at close range, and brought one of them down on fire in a spiral nose-dive.

Flt. Sub-Lt. RONALD GRAHAME, R.N.A.S.

For exceptional gallantry in attacking and beating off four enemy seaplanes whilst on escort duty off the Belgian coast on Sept. 22nd, 1916.

Flt. Sub-Lt. DANIEL MURRAY BOYNE GALBRAITH, R.N.A.S.

In recognition of his services in attacking a large enemy two-seater seaplane on Sept. 28th, 1916. His machine was severely damaged by gun-fire from the enemy machine, which finally blew up in the air.

* * *

WAR OFFICE, Oct. 25th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flt. Comdrs.—From Flying Officers, and to be temp. Capts. while so empled:—Temp. Sec. Lt. P. G. Horswell, Gen. List, Oct. 10th. Sec. Lt. P. A. Byrne, R.A., Oct. 14th. Capt. H. J. F. Hunter, Rif. Brig., from a Flying Officer, Oct. 17th.

Flying Officers.—Temp. Sec. Lt. A. R. M. Rickards, Gen. List, Oct. 4th. Temp. Sec. Lt. E. G. S. Wagner, R. War. R., temp. Sec. Lt. G. F. Haseler, R. W. Surr. R., and to be transf'd. to Gen. List, Oct. 6th. Sec. Lt. R. M. Foster, R. Fus., and to be sec'd., Sec. Lt. F. H. O'Beirne, S.R., Sec. Lt. G. B. Pratt, R.A., and to be sec'd., Oct. 7th. Sec. Lt. (on prob.) H. W. Norman, S.R.,

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temp. Sec. Lt. C. M. White, Gen. List, Oct. 8th. Sec. Lt. D. Ransom, 12th Austral. Inf. Bn., Oct. 10th.

Equipment Officer, 2nd Cl.—Lt. E. S. Bramham, S.R., from an Asst. Equipment Officer, Oct. 11th.

Equipment Officers, 3rd Cl.—Sec. Lt. W. R. G. Atkins, S.R., June 19th. Temp. Sec. Lt. F. H. Hawksford, Gen. List, Sept. 20th. Temp. Sec. Lt. J. A. Payne, Gen. List, Sept. 25th. Sec. Lt. A. N. Greg, R. War. R., T.F., from a Flying Officer (Observer), Oct. 9th.

MEMORANDUM.—Lt. W. Hardcastle, from a Cadet Bn., R. War. R., to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Aug. 24th.

SPECIAL RESERVE OF OFFICERS.—**SUPPLEMENTARY TO REGULAR CORPS.**—R.F.C.—MIL. WING.—Sec. Lts. to be Lts.:—L. F. Hursthouse, (temp. Capt.) H. B. T. Childs, (temp. Capt.) G. S. Sansom, (temp. Capt.) A. C. Gilling, C. St. Noble, B. V. Grealy, R. P. J. McCoy, V. F. P. Bryce, S. Ransom, G. L. Godden, Oct. 1st. W. F. Anderson, from Lt., Gen. List, Canada, to be Lt., Oct. 1st. Sec. Lt. (on prob.) C. H. White resigns his commn., Oct. 26th.

TERRITORIAL FORCE.—R.F.A.—HIGH. BDE.—Sec. Lt. R. Manners is secd. for duty with Anti-Aircraft Depot, Shoburness, June 12th.

INFANTRY.—A. AND S. HIGHRS.—Sec. Lt. J. D. Cowie is secd. for duty with the R.F.C., Oct. 11th.

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A Supplement to the "London Gazette" of Oct. 25th contains a dispatch which the Secretary for War has received from General Sir Reginald Wingate, Sirdar and Governor-General of the Soudan, describing the military operations undertaken in the early part of 1916 against Ali Dinar, Sultan of Darfur, in which the following comment on the work of the R.F.C. appears:—

A most interesting feature of the whole operations was the use made of the aeroplane in desert warfare. Its appearance exercised a great moral effect. As the Sultan's troops were emerging from the south end of the capital the day after the battle, Lt. J. C. Slessor, R.F.C., circled over and bombed them. Another notable feat was a flight of eight hours over the desert to find the enemy's troops—"a very remarkable performance under local flying conditions," with the petrol supply affected by the great temperature. The conduct and efficiency of the aviators, says the dispatch, throughout fully upheld the splendid traditions of the R.F.C.

The following are among those mentioned as deserving of special notice and commendation:—

ROYAL FLYING CORPS.—Bannatyne, Lt. (temp. Maj.) E. J., 19th Hussars; Groves, Maj. (temp. Lt.-Col.) P. R. C., Shropshire L.I.; Slessor, Lt. J. C., Spec. Res.; Batty, 2197 Flt. Sergt. F.; Hemming, 3724 Sergt. H. A.; Horton, 3682 1st Class Air Mechanic T.; Maddams, 4745 Pte. G., Army Service Corps.

* * *

From the "London Gazette" Supplement, Oct. 26th, 1916.

WAR OFFICE, Oct. 26th.

REGULAR FORCES.—**ESTABLISHMENTS.**—R.F.C.—MIL. WING.—Adjts.—Temp. Sec. Lt. S. O. Barnsdale, Gen. List, from a Flying Officer, and to be temp. Lt. whilst so empld., vice temp. Capt. G. C. Anne, Yorks L.I., T.F., Oct. 8th; Maj. M. Freeman, Worc. R., Spec. Res., Oct. 12th.

Equipment Officer, 3rd Cl.—Sec. Lt. (on prob.) (now temp. Hon. Lt.) E. A. Salt, Spec. Res., from July 1st to Aug. 31st.

MEMORANDA.—Actg. Sgt.-Maj. H. C. S. Bullock to be Sec. Lt. for duty with R.F.C., Oct. 19th.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Cdt. S. F. Barton, Sgt. J. S. Berdoo, Cdt. N. H. Knock, Sept. 10th.

SPECIAL RESERVE OF OFFICERS.—**SUPPLEMENTARY TO REGULAR CORPS.**—R.F.C.—The following resign their commns.: Sec. Lt. R. L. Burdon-Sanderson, Sec. Lt. (on prob.) T. A. J. Guyatt, Sec. Lt. (on prob.) L. W. Wood, Oct. 27th.

To be Sec. Lts. (on prob.):—W. W. Hall, Aug. 22nd. M. J. James, Sept. 6th. R. R. Prentice, Oct. 9th. R. Clelland, Oct. 16th.

TERRITORIAL FORCE.—HANTS R.—Lt. (temp. Capt.) B. S. Foster is now secd. for duty with R.F.C., Sept. 2nd.

MIDD'X R.—Sec. Lt. F. A. Swoffer is secd. for duty with the R.F.C., Oct. 12th.

* * *

From the "London Gazette," Oct. 27th, 1916.

WAR OFFICE, Oct. 27th.

GENERAL STAFF.—A.G.'s AND Q.M.G.'s STAFF.—A. A. AND Q.M.Gs.—Maj. H. T. C. Singleton, D.S.O., High. L.I., and to be temp. Lt.-Col. whilst so empld., vice Maj. C. C. Marindin, R.A., Sept. 20th, 1916. Lt.-Col. E. H. Reynolds, Australian Imperial Force, vice Maj. J. L. Whitham, C.M.G., 12th Bn., Australian Imperial Force, Sept. 23rd, 1916.

REGULAR FORCES.—**ESTABLISHMENTS.**—R.F.C.—Flying Officers (Observers).—Temp. Lt. C. H. Brewer, Bedf. R., Sept. 1st. Temp. Lt. E. W. Greswell, Ches. R., and to be transfd. to Gen. List, Sept. 25th. Sec. Lt. G. L. Owen, E. Lan. Brig.

R.F.A., T.F., Sept. 26th. Sec. Lt. G. R. Bolitho, Devon. R., Spec. Res., and to be secd., and temp. Sec. Lt. (on prob.) W. H. Buckeridge, Gen. List, Oct. 3rd. Lt. E. T. Owles, R. Ir. Fus., Spec. Res., and to be secd., Oct. 4th. Lt. (temp. Capt.) J. L. Head, Lond. R., T.F., Oct. 5th. Temp. Lt. W. R. G. Pearson, A.S.C., and to be transfd. to Gen. List; Lt. S. P. Gamon, Ches. R., T.F.; Sec. Lt. (temp. Lt.) W. R. Haggas, N. Lan. R., T.F.; temp. Sec. Lt. C. C. Miller, W. Rid. R.; temp. Sec. Lt. R. W. Follit, R.A., and to be transfd. to Gen. List; Sec. Lt. R. A. Wingfield, R. Ir. Fus., and to be secd., Oct. 8th.

Equipment Officer, 2nd Cl.—Sec. Lt. C. G. Coe, Spec. Res., from an Asst. Equipment Officer, and to be temp. Lt. whilst so empld., Sept. 30th.

Adjts.—Lt. F. S. Isaac, Worc. R., Spec. Res., and to be secd., vice Lt. (temp. Capt.) A. J. Child, Lond. R., T.F., Sept. 21st. Lt. H. French, W. York R., Spec. Res., from a Flying Officer (Observer), Sept. 27th.

MEMORANDUM.—The notification in the "Gazette" of Aug. 24th, 1916, regarding temp. Hon. Capt. G. B. Cockburn, is cancelled.

SPECIAL RESERVE OF OFFICERS.—**SUPPLEMENTARY TO REGULAR CORPS.**—R.F.C.—Sec. Lt. (on prob.) H. W. Norman is confirmed in his rank.

The appt. of Sec. Lt. (on prob.) E. A. Salt, notified in "Gazette" of July 17th, is antedated to June 14th.

* * *

A special supplement to the "London Gazette," issued on Oct. 27th, announces that His Majesty the King has been graciously pleased to award the Military Medal for bravery in the field to the undermentioned non-commissioned officers and men. It is explained that, as the medals have been awarded for services rendered on various occasions during the progress of the campaign, the ranks now shown are not in all cases those held by the recipients when the acts of gallantry were performed:—

2202 Cpl. S. Attwater, R.F.C.

2916 Cpl. J. E. Beddows, R.F.C.

807 Flt. Sgt. W. G. Borrett, R.F.C.

1863 Sgt. C. Brown, R.F.C.

1305 1st Cl. Air Mech. J. S. Clark, R.F.C.

2126 Sgt. A. R. Edwards, R.F.C.

Air Mech. E. C. Gill, R.F.C.

45311 2nd Class Air Mech. J. J. Hollyhead, R.F.C.

25076 2nd Class Air Mech. (Actg. Cpl.) F. H. Marshall, R.F.C.

1049 Cpl. W. N. Mayger, R.F.C.

2437 Sgt. I. Monks, R.F.C.

330 2nd Class Air Mech. T. Murray, R.F.C.

882 2nd Class Air Mech. H. S. Porter, R.F.C.

2594 Sgt. A. H. Read, R.F.C.

92 Flt. Sgt. F. J. Smith, R.F.C.

2551 1st Class Air Mech. F. Thomason, R.F.C.

364 Flt. Sgt. (Actg. W.O.) G. Thornton, R.F.C.

* * *

From the "London Gazette" Supplement, Oct. 28th, 1916.

WAR OFFICE, Oct. 28th.

REGULAR FORCES.—**ESTABLISHMENTS.**—R.F.C.—MIL. WING.—Flying Officers (Observers).—Temp. Sec. Lt. R. J. G. Temple, R.A., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) A. J. Cathie, Gen. List, Oct. 1st.

SPECIAL RESERVE OF OFFICERS.—**SUPPLEMENTARY TO REGULAR CORPS.**—R.F.C.—Sec. Lt. H. H. Burt resigns his commn., Oct. 29th.

Following Sec. Lts (on prob.) are confirmed in their rank:—C. Crawford, A. D. Robertson, A. E. Biggs, W. P. Bingham.

TERRITORIAL FORCE.—R.F.A.—LOWLAND BRIG.—Sec. Lt. T. V. Hughes relinquishes his commn. on appt. to the R.N.A.S., Oct. 19th.

R.G.A.—PEMBROKE.—Sec. Lt. (temp. Lt.) H. D. Johns is secd. for Anti-Aircraft duties, Oct. 20th.

NORTH SCOTTISH.—Officers secd. for Anti-Aircraft duties:—Lt. (temp. Capt.) J. Anderson, Sec. Lt. (temp. Lt.) A. Hardy, Sec. Lt. H. McE. Grant, Sec. Lt. H. Corney, Oct. 20th.

SUSSEX.—Following Officers secd. for Anti-Aircraft duties:—Sec. Lt. (temp. Lt.) J. G. C. Perrett-Young, Sec. Lt. E. S. R. Milton, Sec. Lt. R. E. Coleman, Sec. Lt. A. Hill, Sec. Lt. J. R. Peacey, Sec. Lt. L. R. Mason, Oct. 20th.

TYNEMOUTH.—Officers secd. for Anti-Aircraft duties:—Sec. Lt. P. S. Short, Sec. Lt. R. S. Hutchinson, Oct. 20th.

W. RIDING.—Officers secd. for Anti-Aircraft duties:—Sec. Lt. E. M. Savory, Sec. Lt. J. Bartholomew, Oct. 20th.

* * *

From the "London Gazette" Supplement, Oct. 30th, 1916.

WAR OFFICE, Oct. 30th.

REGULAR FORCES.—The undermentioned Wt. Os.; N.C.Os. and Men to be Sec. Lts. for service in the Field:—

MEMORANDA.—For duty with R.F.C.: Pte. C. P. Lowry, from Can. Army Med. Corps, Aug. 27th, 1916. Armr. Staff Sergt. J. Allan, from Can. Ord. Corps, Sept. 19th, 1916. Sept. 27th, 1916: Sergt. Wilfrid Sieer, from Lond. R., T.F.; Sergt. Harold John Hugh Dicksee, from Lond. R.; T.F.; Sergt. J. L. Denman, from Can. Forces; Corpl. H. Brooks, from Can. Infy.; Pte. L. N.

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Smith, from Can. Infy.; Pte. A. W. Waddy, from a Can. Divnl. Supply Col. Corpl. G. H. Boorne, from a Can. Divl. Sig. Co., Sept. 28th, 1916. Oct. 3rd, 1916: Corpl. J. K. Campbell, from a Can. Sig. Co.; Pte. R. Ritchie, from Can. A.S.C. Oct. 6th, 1916: Mech. Sergt.-Maj. G. E. Bower, from A.S.C.; Flt. Sergt. Stanley Frost, from R.F.C.; Actg. Sergt. W. A. L. Spencer, from A.S.C.; Actg. Bdr. Archibald C. Heaven, from Machine Gun Corps; Lce.-Corpl. Frank Young, from Cyclist Bn., T.F.; Lce.-Corpl. E. R. Stewart, from Can. Sig. Serv.; Pte. O. G. Durham, from Can. Corps, Cav. Regts. Oct. 9th, 1916: 1st Cl. Air Mech. Charles John Geddes, from R.F.C.; 2nd Cl. Air Mech. Leonard Ernest Yeomans, from R.F.C.; 2nd Cl. Air Mech. William Le Lorraine, from R.F.C.

ESTABLISHMENTS.—R.F.C.—SCHOOLS OF INSTRUCTION.—Asst. Comdts., Staff Officers, 2nd Cl. (graded for pay as Brig. Majors). Sept. 19th, 1916: Temp. Maj. A. E. G. MacCallum, Gen. List, from a Park Comdr.; Lt. (temp. Capt.) S. W. Smith, R.A., from a Flt. Comdr.

MILITARY WING.—Sqn. Comdr.—Capt. B. F. Moore, R. War. R., from a Flt. Comdr., and to be temp. Maj. whilst so empld., Oct. 1st, 1916.

Flying Officers.—Sec. Lt. J. G. B. Baines, R. War. R., and to be secd., Sept. 22nd, 1916. Oct. 4th, 1916: Sec. Lt. C. G. H. Winter, Spec. Res.; Sec. Lt. E. B. Smyth, Spec. Res.; Sec. Lt. J. C. Young, Spec. Res. Oct. 8th, 1916: Lt. S. E. Goodwin, Lpool. R., T.F.; temp. Sec. Lt. K. A. Meek, W. York. R., and to be transfld. to Gen. List; Sec. Lt. E. Jacot, Spec. Res. Oct. 9th, 1916: Sec. Lt. A. Winks, N. Mid. Div. Cyclist Cos., Divl. Mtd. Troops, T.F.; temp. Sec. Lt. (on prob.) R. D. Baker, Gen. List. Oct. 10th, 1916: Temp. Lt. C. F. Eckel, Dorset R., and to be transfld. to Gen. List; Sec. Lt. (temp. Lt.) C. Dunlop, 1st Lovat's Scouts Yeo., T.F.; temp. Sec. Lt. T. B. Bruce, Gen. List; Sec. Lt. C. Crawford, Spec. Res. Oct. 11th, 1916: Temp. Sec. Lt. R. B. Wainwright, attd. 17th Lrs.; Sec. Lt. J. R. Statter, Som. L.I., Spec. Res., and to be secd.; Sec. Lt. J. E. H. Bibby, R. W. Fus., and to be secd.; Lt. J. G. L. Brown, R.F.A., Spec. Res.; temp. Lt. J. Glover, R.A., and to be transfld. to Gen. List; temp. Sec. Lt. (on prob.) J. W. Somers, Gen. List; Sec. Lt. (temp. Lt.) C. McC. H. M. Caffyn, E. Surr. R., and to be secd.; Capt. L. W. Hopkins, 21st Can. Inf. Bn.; temp. Sec. Lt. D. M. Faure, Gen. List, from a Flying Officer (Observer), with seny. from Apr. 23rd, 1916; Sec. Lt. J. D. Cowie, Arg. and Suthd. Highrs., T.F.; temp. Sec. Lt. C. A. Sutcliffe, Gen. List. Oct. 12th, 1916: Sec. Lt. A. Jennings, R.A., and to be secd.; Sec. Lt. F. A. Swoffer, Middx. R., T.F. Sec. Lt. S. Collier, Ches. R., T.F., Oct. 14th, 1916.

Equipment Officers, 3rd Cl.—Temp. Sec. Lt. (on prob.) W. Hardcastle, Gen. List, Sept. 18th, 1916. Oct. 4th, 1916: Sec. Lt. M. Keegan, R. Dub. Fus.; temp. Sec. Lt. W. B. Everton, Gen. List; temp. Sec. Lt. A. S. Morris, Gen. List; temp. Sec. Lt. T. E. Drowley, Gen. List; temp. Sec. Lt. H. McKenna, Gen. List; Sec. Lt. J. Kemper, S. Lan. R.

Asst. Experimental Officer (graded as an Equipment Officer, 3rd Cl.).—Sec. Lt. F. W. Musson, N. Lan. R., T.F. Oct. 12th, 1916.

MEMORANDA.—Sec. Lts. to be temp. Lts. whilst serving with R.F.C.:—E. Robinson, R.A.; H. M. T. Lehmann, Essex R.; S. A. Villiers, R.A.; E. L. Benbow, R.A.; R. L. Chidlaw-Roberts, Hamps. R., A. H. Bottrell, R. War. R., Sept. 1st.

Sec. Lts., Spec. Res., to be temp. Lts. whilst serving with R.F.C.:—M. H. Turner, Dorset R.; J. B. E. Crosbie, Worc. R.; N. M. Hoskins, N. Staff. R.; C. de W. Taylor, 20th Hrs.; A. H. Francis, R. Suss. R., (now Lt.) A. R. Johnston, High. L.I.; N. Howarth, R. Lanc. R.; G. Aste, A.S.C., H. S. MacNeil, R.F.A., A. P. V. Daly, Conn. Rang., Sept. 1st.

Temp. Sec. Lts. to be temp. Lts. whilst serving with R.F.C.:—C. H. Stocks, R. H. Sievwright, G. K. Palmer, E. C. Winkley, J. A. Simpson, S. H. Ellis, G. F. Westcott, G. A. Thompson, J. S. Anderson, A. L. Findlay, A. M. Walters, L. R. Heywood, F. B. Sedgwick, C. A. Brewster-Joske, H. T. Shaw, R. J. Sanceau, J. McArthur, K. F. Balmain, W. S. De Ropp, O. Hughes, L. J. Mann, H. A. Arbuthnot, Sept. 1st.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Pte. J. C. Griffith, from N. Zealand Expeditionary Force, Sept. 11th. Lce.-Corpl. L. Legge, Oct. 11th.

Flt. Sgt. P. A. Rich, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with Mil. Wing of that Corps, Oct. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Noel Charles Fitzroy Francis, from Sec. Lt. (temp. Lt.), Lond. Brig., R.F.A., T.F., to be Lt., Oct. 4th, 1916. Sec. Lt. D. Cox resigns his commn. on account of ill-health, Oct. 31st, 1916. Sec. Lt. (on prob.) R. Baltus resigns his commn., Oct. 31st, 1916.

The undermentioned Sec. Lts. (on prob.) are confirmed in their rank:—E. Jacot, C. G. H. Winter, J. C. Young, E. B. Smyth, T. McC. Yarwood, A. C. Blackmore, F. H. Postlethwaite, S. S. Kaye. The undermentioned to be Sec. Lts. (on prob.):—Walter Henry Ross Skudder, Sept. 4th, 1916. William Aitken Haslam, Oct. 11th, 1916.

TERRITORIAL FORCE.—INFANTRY.—LIVERPOOL REGT.—Sec. Lt. E. W. Stubbs is granted the temp. rank of Lt. whilst serving with the R.F.C., Sept. 1st, 1916.

ROYAL SUSSEX REGT.—Sec. Lt. W. W. Stainer is granted the temp. rank of Lt. whilst serving with the R.F.C., Sept. 1st, 1916.

SOUTH LANCASHIRE REGT.—Sec. Lt. W. E. Birch is granted the temp. rank of Lt. whilst serving with the R.F.C., Sept. 1st, 1916.

MIDDLESEX REGT.—Sec. Lt. E. M. L. Ainslie is granted the temp. rank of Lt. whilst serving with the R.F.C., Sept. 1st, 1916.

CAMERON HIGHLANDERS.—Sec. Lt. T. Davidson is granted the temp. rank of Lt. whilst serving with the R.F.C., Sept. 1st, 1916.

LONDON R.—Sec. Lt. G. D. F. Keddie is granted the temp. rank of Lt. whilst serving with the R.F.C., Sept. 1st, 1916.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Oct. 28th.

The following Officers had the honour of being received by the King, when His Majesty conferred upon them the Military Cross: Capt. HORACE SHIELD, North Staffordshire Regt. and R.F.C.

Lt. ALAN BOTT, Royal Garrison Artillery and R.F.C.

Lt. ROBERT USHER, Wiltshire Regt. and R.F.C.

Sec. Lt. ARTHUR PEARSON, Machine Gun Corps, attd. R.F.C.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Oct. 24th.—The following have been granted temp. commissions as Sub-Lts., R.N.V.R., to date as stated: Chief Petty Officer W. J. Liberty, Oct. 16th; and Mr. F. H. Hudson, Oct. 16th.

Oct. 25th.—The following have been entered as Proby. Flt. Officers (Temp.), seny. Oct. 29th:—D. A. Stamps, F. J. W. Mellersh, H. C. Arnold, C. R. Pegler, D. F. Warren, E. M. Porter, W. J. K. Gulland, J. S. de Wilde, and H. B. Brearley.

Lt.-Comdr. (Temp. R.N.V.R.).—R. W. McGrath, apptd. as Act. Comdr. (temp. R.N.V.R.), seny. Oct. 23rd.

Mr. A. M. Humble-Crofts (A.B., R.N.V.R.) granted temp. commn. as Sub-Lt. (R.N.V.R.), seny. Oct. 29th.

The following have been granted the rank of Act. Gnr. (temp.) seny. Oct. 23rd:—J. Corral, W. J. Shilcott, and F. J. Pope (all Ch. Petty Officers), G. Colbert, E. Dowding, and F. C. Dike (all Petty Officers).

Ch. Armourers (Pensioned).—J. F. Joyce, granted rank of Act. Wt. Armourer (temp.), seny. Oct. 23rd.

Oct. 27th.—Messrs. A. B. Macintosh and A. W. Phillips, both entered as Proby. Flt. Officers (temp.), and apptd. to "President," for R.N.A.S., seny. respectively Oct. 24th and Nov. 5th.

Oct. 28th.—Mr. N. S. Lott entered as Proby. Flt. Officer (temp.), seny. Oct. 29th.

Mr. A. B. Murray, granted a temp. commission as Sub-Lt. (R.N.V.R.), seny. Oct. 25th.

Oct. 30th.—The undermentioned have been entered as Proby. Flt. Sub-Lts., for temp. service, to date as stated:—A. F. MacDonald, Sept. 5th. F. MacP. Bryans and C. E. S. Lusk, Sept. 26th.

* * *

OFFICIAL COMMUNIQUÉS.

Oct. 24th.—On the afternoon of the 23rd instant a naval aeroplane attacked four enemy seaplanes off Ostend.

Our machine was under fire from all four seaplanes, but succeeded in bringing down one, which was completely destroyed, and in driving off the others.

Oct. 26th.—On Monday and Tuesday attacks in force by Naval aeroplanes were carried out on the railway stations at Buk and Drama (both in Macedonia, on the railway from Constantinople to Salonika).

Considerable damage was done to the rolling stock. One of our machines failed to return from the attack on Buk.

* * *

THE CASUALTY LIST.

Reported Oct. 31st.

PRISONERS OF WAR IN THE HANDS OF THE BULGARIANS.—Flt. Sub-Lt. Geoffrey K. Blandy, R.N. (wounded).

Lt. Reginald G. Blakesley, R.N.V.R.

* * *

PERSONAL NOTICES.

ENGAGEMENTS.

BREMNER—HURD.—An engagement is announced between Flt. Lt. Francis Donald Holden Bremner, R.N., elder son of Capt. Donald Bremner, late R.A., Assistant Commissioner, City of London Police, and Mrs. Bremner, and Vivien Grosier Hurd, daughter of Mr. and Mrs. Archibald Hurd, of Hampstead, and Hope Point, St. Margaret's Bay, Kent.

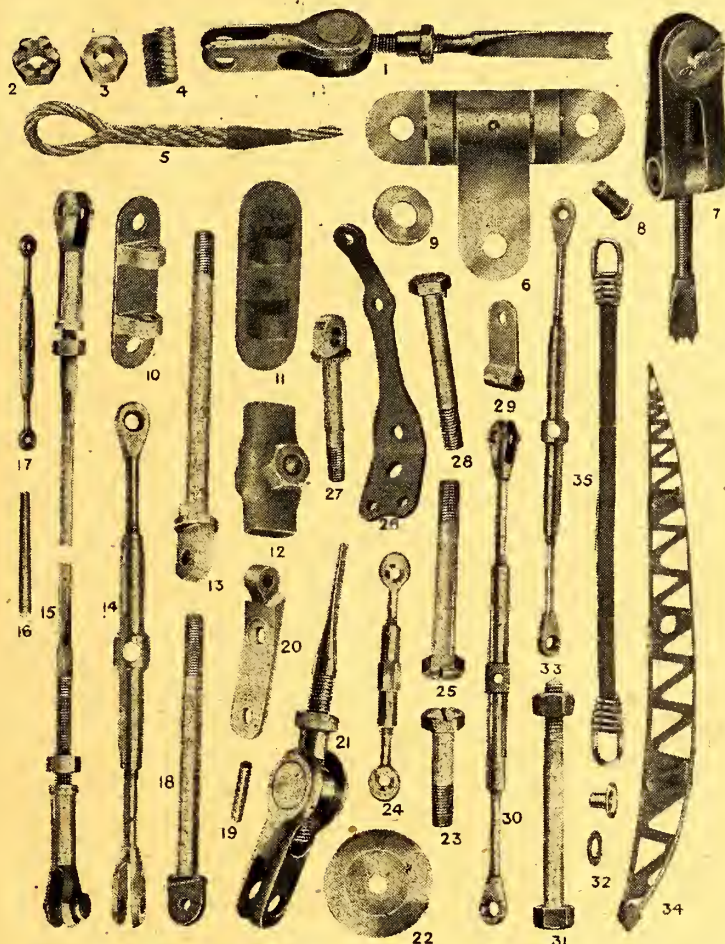
* * *

MILLS—HALLIDAY.—A marriage will take place next month between Miss Vera Halliday, daughter of Sir Frederick and Lady Halliday, and Flt. Lt. John S. Mills, R.N.

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19. Hinge Pins (Pt. 22)
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24. Strainers (Binet Type)
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31. Bolt and Nuts (Metric)
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33. Strainers (Binet Type)
34. Wood Rib
35. Springs (Rubber Cord)

READY TO-DAY.

OUR NOVEMBER ILLUSTRATED STOCK LIST (No. 27—32 pages). Weekly Supplements will follow (No. 27a) on Wed., Nov. 8th, (No. 27b) Wed., Nov. 15th. These lists are issued only to Aircraft Manufacturers and to those connected with or interested in the Aircraft Industry or the Air Services. May we send you a copy regularly when issued?

A.
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A SPECIAL LIST OF A.G.S. PARTS will be published this week. This will contain about 32 pages, and will include all the most important items. Each part will be illustrated by reproduction of actual photographs and blue print drawings.

Complete dimensions and R.A.F. Material Specifications of all marked numbers will also be given. This List will be of great value to all connected with the Aircraft Industry or the Air Services, and most useful for reference in connection with our regular Monthly Stock List. Copies may be had free on application when ready.

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LIDDERDALE—WALKER.—A marriage has been arranged between Flt. Comdr. J. H. Lidderdale, R.N., fourth son of Dr. and Mrs. James Lidderdale, of Cleavelands, Prestbury, Cheltenham, and Maud, youngest daughter of Mr. and Mrs. J. Hanson Walker, 2, Queen's Elm Square, Chelsea.

MILITARY.

G.H.Q. COMMUNIQUÉS.

Oct. 26th, 9.30 p.m.—In spite of the unfavourable weather, our aeroplanes yesterday co-operated successfully with our artillery and bombed many enemy billets and depots. Three of our machines have not returned.

Oct. 27th, 8.58 p.m.—Yesterday, enemy aeroplanes showed unusual activity. An aerial engagement took place between large numbers of machines on both sides. It is reported that five machines fell during the fight, two of which were our own.

On another occasion one of our pilots, encountering a formation of 10 hostile machines, attacked them single-handed, and dispersed them far behind their own lines.

9.55 p.m.—Yesterday, in spite of a strong adverse wind, much useful reconnaissance work was done by our aeroplanes. One of our machines is missing.

Oct. 30th, 9.30 p.m.—Owing to the inclement weather there was little aerial activity yesterday.

One enemy machine was seen to fall in flames.

WAR OFFICE COMMUNIQUÉ.

The General Officer Commanding British Forces in Greece reports—

Oct. 28th-29th.—North of Lake Doiran hostile aeroplanes were brought down.

Struma Front.—West of Demirhissar an enemy transport park was bombed by our aeroplanes with excellent results.

THE CASUALTY LIST.

Reported Oct. 25th.

WOUNDED.—Clapperton, Lt. C. R., R.G.A. and R.F.C.

MISSING.—Bowman, Lt. W. P., W. Yorks R., attd. R.F.C.

Clayton, Sec. Lt. G., W. Yorks R., attd. R.F.C.

Godwin, Sec. Lt. C. C., R.F.C.

Pulleyn, Sec. Lt. J. K., Dorset R., attd. R.F.C.

Wadden, Lt. G., R. Irish Fus., attd. R.F.C.

R.F.C.—Grundy, 6709, 1st Cl. Air Mech. A. (Astley, Manchester).

Reported Oct. 26th.

KILLED.—Robertson, Lt. N. MacL., R.F.A. and R.F.C.

MISSING.—Byrne, Sec. Lt. P. A., D.S.O., R.F.A., attd. R.F.C.

Dingley, Sec. Lt. R. L., Worcester R. and R.F.C.

Ellis, Lt. P. C., Highland L.I., attd. R.F.C.

Parker, Sec. Lt. J. K., R. Scots Fus., attd. R.F.C.

Roberts, Sec. Lt. C. L., S. Lancs R., attd. R.F.C.

Wilson, Sec. Lt. J. C., Black Watch and R.F.C.

PREVIOUSLY UNOFFICIALLY, NOW OFFICIALLY, REPORTED WOUNDED AND PRISONER OF WAR IN GERMAN HANDS.—Selby, Sec. Lt. C. W. P., R.W. Kent R., attd. R.F.C.

PREVIOUSLY REPORTED BELIEVED TAKEN PRISONERS AT KUT-EL-AMARA, NOW REPORTED PRISONERS OF WAR.—R.F.C.—Nickolls, 7373 2nd Cl. Air Mech. R. G. (Hackney, N.E.); Wells, 7670 2nd Cl. Air Mech. S. J. (Sherborne).

BELIEVED TAKEN PRISONER AT KUT-EL-AMARA.—R.F.C.—Fairhead, 3388 2nd Cl. Air Mech. W. (Burton-on-Trent).

Reported Oct. 27th.

KILLED.—Welsford, Sec. Lt. G. K., R.F.C.

MISSING.—Pomeroy, Sec. Lt. N. R., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS OF WAR IN GERMAN HANDS.—Geen, Sec. Lt. C., London Regt. and R.F.C.

Tullis, Sec. Lt. J. K., R.F.A. and R.F.C.

Whittle, Capt. O. L., S. Lancs. Regt. and R.F.C.

CORRECTION.—Smith, Sec. Lt. S. M., London Regt. and R.F.C. (reported wounded), should read:—Martin-Smith, Sec. Lt. H. S., London Regt. and R.F.C.

WOUNDED.—R.F.C.—Syme, 27153 2nd Cl. Air Mech. E.; Taylor, 9782 2nd Cl. Air Mech. S. C.

MISSING.—R.F.C.—Clarkson, 3049 Sgt. A.

Reported Oct. 28th.

KILLED.—Davis, Sec. Lt. R., R.F.C.

Drewery, Sec. Lt. A. B., R.F.C.

WOUNDED.—Callender, Sec. Lt. G. G., R.F.C.

Filley, Capt. O. Dwight, M.C., R.F.C.

Harvey, Lt. R. P., Norfolk R., attd. R.F.C.

Young, Sec. Lt. W. B., R.F.C.

MISSING.—Black, Sec. Lt. W., Durham L.I. and R.F.C.

Reported Oct. 30th.

KILLED.—Nops, Sec. Lt. T. W., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Cooper, Capt. J. O., R.F.C.

Corbold, Lt. H. M., R.F.C.

Oliver-Jones, Lt. A. V., R.F.A., attd. R.F.C.

DIED OF WOUNDS.—Cropper, Sec. Lt. A., Wilt Regt. and R.F.C.

WOUNDED.—Fenwick, Sec. Lt. M. J., R.F.C.

Garratt, Sec. Lt. P. C., R.F.C.

Harris, Sec. Lt. I. M., King's R. Rifle Corps, attd. R.F.C.

Kock, Sec. Lt. A., R.F.C.

Simpson, Sec. Lt. J. A., R.F.C.

MISSING.—Raymond-Barker, Sec. Lt. A. B., R.F.C.

Hann, Sec. Lt. C. C., R.F.C.

Holtom, Sec. Lt. J. N., R.F.C.

Marchant, Sec. Lt. F. G. W., R.W. Kent Regt. and R.F.C.

Porter, Capt. L., R.F.C.

Samuels, Sec. Lt. G. B., Durham L.I., attd. R.F.C.

Shepherd, Sec. Lt. A. L. M., King's R. Rifle Corps, attd. R.F.C.

Thuell, Sec. Lt. W. J., R.F.C.

Wade, Sec. Lt. O. J., R.W. Kent Regt. and R.F.C.

Willeox, Sec. Lt. W. T., W. Yorks Regt. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Patterson, Sec. Lt. A. F. A., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Cushing, Sec. Lt. D., R.F.C.

Kennedy, Sec. Lt. C. J., R.F.C.

Molloy, Sec. Lt. T. P. L., Dorset R. and R.F.C.

Walker, Lt. R. D., R.F.C.

Chance, Lt. W. H. S., Worcester Regt. and R.F.C.

OVERSEA FORCES.—**KILLED.**—Rankin, Lt. F. S., Canadian Engrs., attd. R.F.C.

Reported Oct. 31st.

WOUNDED.—Surgey, Sec. Lt. F., Cyclist Co., Divl. Mounted Troops and R.F.C.

MISSING.—Fullerton, Sec. Lt. W. F. H., R.F.C.

Watts, Sec. Lt. R., R.F.C.

* * *

The "Times" correspondent with British Headquarters in France in a message dated Oct. 28th says:—"More than once I have mentioned the fact that we can generally count on an increase in activity in the German aeroplanes after a few days of thick weather. It gives them a breathing space from the attacks of our men, and helps them to pick up their moral. This has once more been the case, and enemy machines have had the temerity to come over our lines in daylight, only to be hunted back again. To-day, with a fairly stiff wind blowing and the clouds very low, it was a beautiful sight to see the sky full of our machines, appearing and disappearing among the clouds, patrolling ceaselessly in the hope of an enemy coming along."

* * *

Flying from London to the North on Oct. 27th, Lt. Kiddie, R.F.C., lost his way and alighted in the recreation ground at New Edlington, near Doncaster, to consult his map. A crowd assembled, and as the machine was restarting it struck and killed a lad aged 13, named Leonard Savage.

* * *

Lt. Oliver Dwight Filley, R.F.C., officially reported wounded, is an American, who was president of the Harvard University Boat Club, and stroke of the Harvard eight which visited England in 1906 to row a match on the tide-way against D. C. R. Stuart's Cambridge crew. Mr. Filley came over to offer his services early in the war, and has since been awarded the Military Cross for daring attacks on German aeroplanes.

PERSONAL NOTICES.

DEATHS.

CHARLES.—Capt. Leslie Stafford Charles, Worcestershire Regt. and R.F.C., reported missing on July 30th and since reported killed on that day, aged 21, was the second son of Mr. and Mrs. R. Stafford Charles, of Broomfield, Stanmore. He was educated at Stanmore Park (the Rev. Vernon Royle), where he took a Mathematical Scholarship for Harrow. At Harrow he became a member of the O.T.C. and the Philatelic Club, and head of his house. He left there in July, 1914, and in the following month received a commission in the Worcestershire Regiment. In May, 1915, he was sent to Gallipoli, and was present at the battles of June 4th-9th. He was subsequently invalided home, and was gazetted Captain on Nov. 20th, 1915. Early this year he joined the R.F.C., and took his pilot's certificate last April. He left for active service on July 5th and lost his life in a combat in the air over the German lines.

* * *

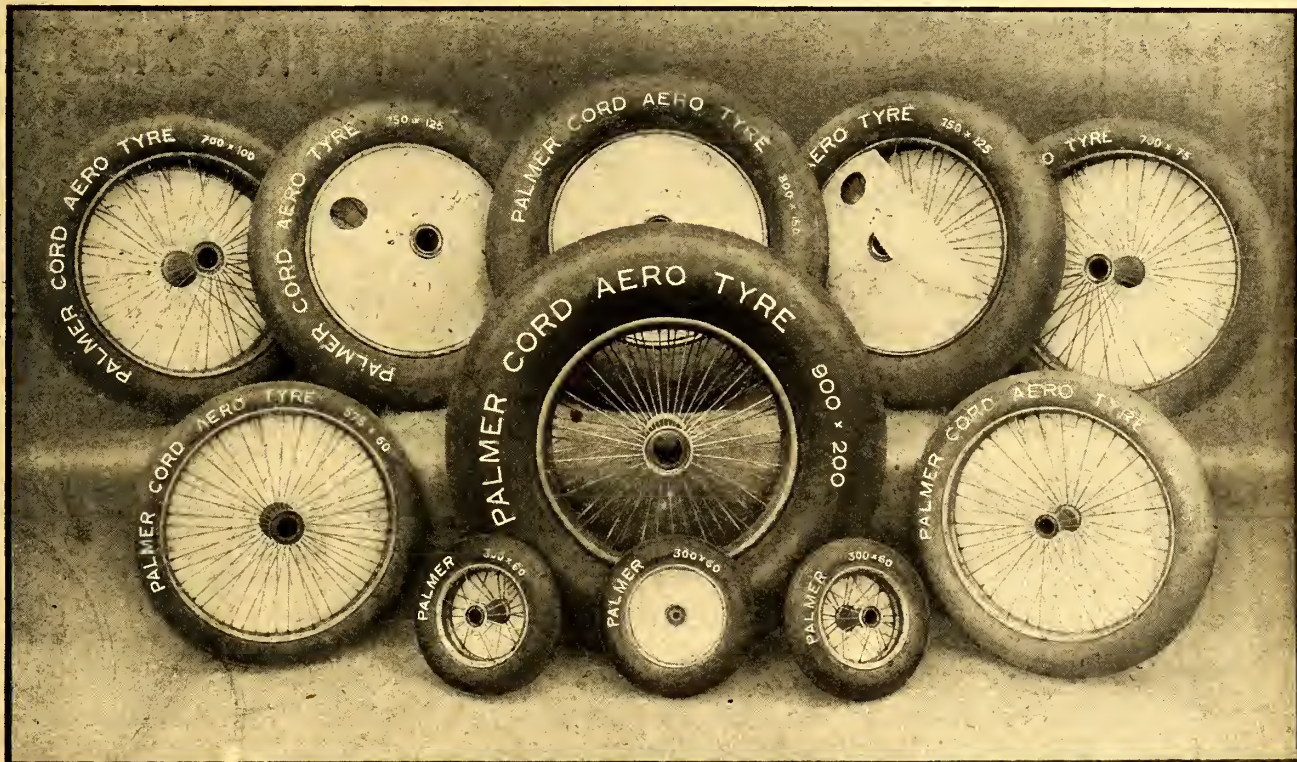
COOPER.—Capt. J. O. Cooper, R.F.C., previously reported missing, now stated to have fallen in action, was 20 years of age, and was the youngest son of Lady Cooper, of Ossemsley Manor, Christchurch, Hampshire. Educated at Lockers Park and Harrow, he returned from Australia for the war. He joined the R.F.C., and got his commission in January, 1915. Capt. Cooper was considered by all who knew him one of the most promising men in the R.F.C., and if he had been spared would have had his squadron before he was 21.

(Continued on page 247.)

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"	17	72.39	12.7	Central	"	20	178.	38.1	132/46	"	4	185.	55.	entral
450 x 60	30	89.	31.75	Central	"	75	178.	31.75	132/46	"	18	178.	44.45	132/46
575 x 60	14	150.	38.1	104/46	700 x 100	2	185.	55.	135/50	"	26	150.	40.	Central
"	21	160.	28.	Central	"	4	185.	55.	Central	"	33	150.	38.1	Central
"	34	150.	31.75	104/46	"	18	178.	44.45	132/46	800 x 150	8	185.	55.	135/50
600 x 75	14	150.	38.1	104/46	"	26	150.	40.	Central	"	10	185.	55.	Central
"	21	160.	28.	Central	"	33	150.	38.1	Central	900 x 200	42	185.	60.32	125/60
"	34	150.	31.75	104/46	"	38	185.	38.09	132/46	"	47	185.	55.	125/60
"					"	66	178.	38.89	132/46					

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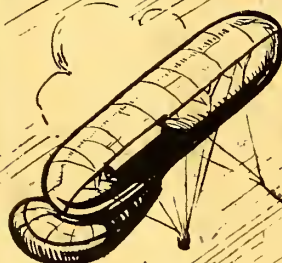
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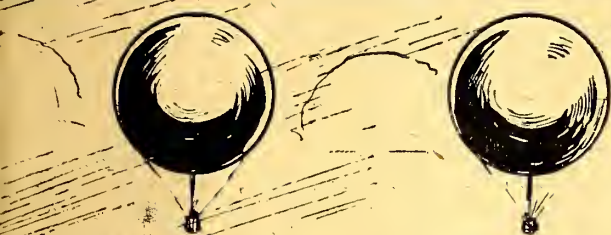
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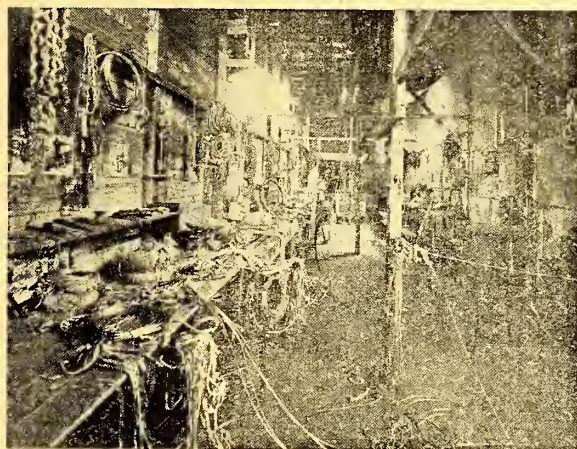




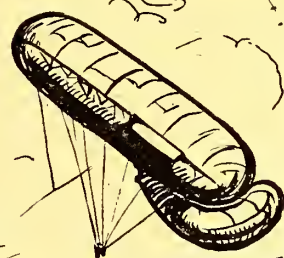
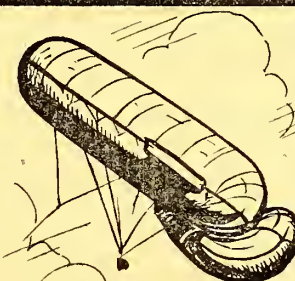
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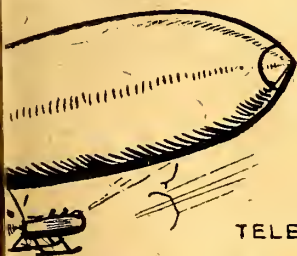
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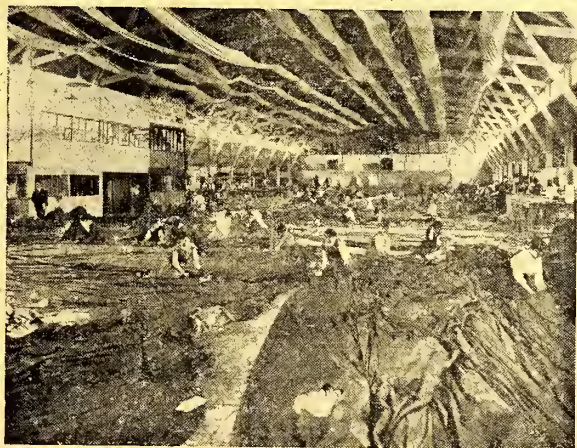
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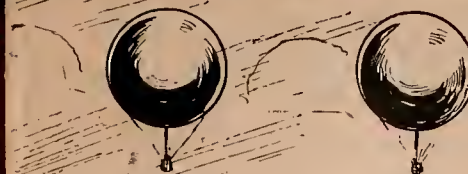




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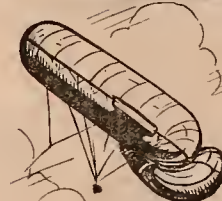
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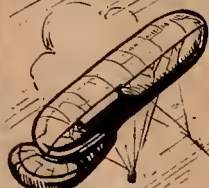
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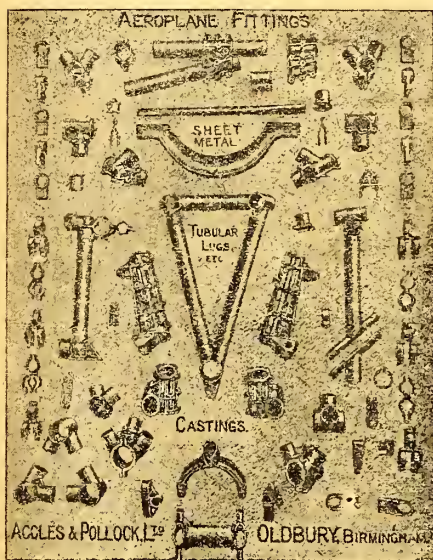
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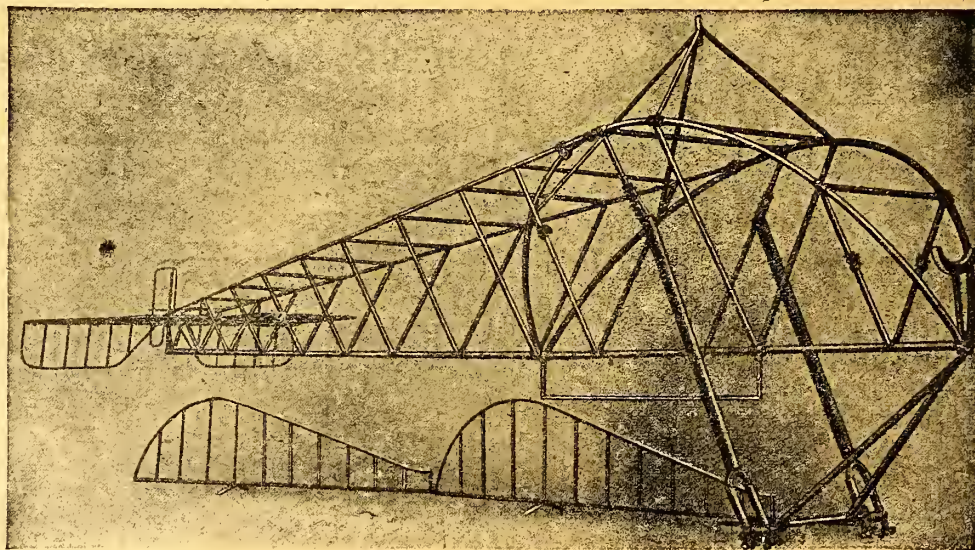
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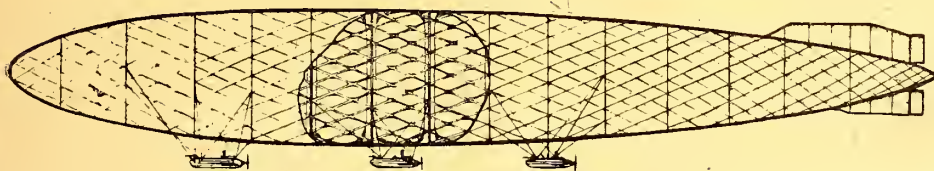
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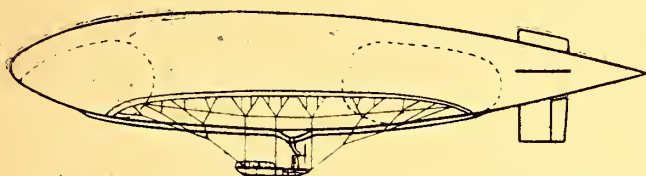
THE AIRSHIP SUPPLEMENT.



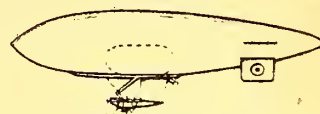
ZEPPELIN (*Rigid*) 220 Metres (670 Feet)



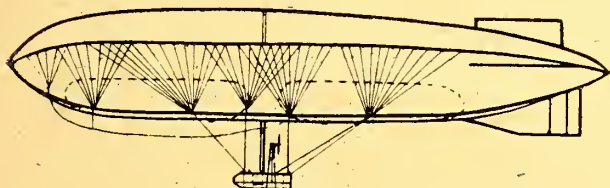
SCHÜTTE-LANZ (*Rigid*) 165 Metres (500 Feet)



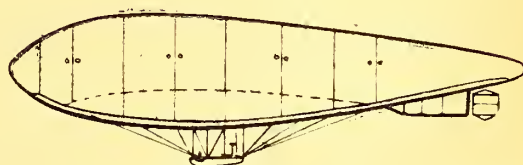
PARSEVAL (*Non-Rigid*) 97 Metres (300 Feet.)



"BLIMP" (*Non-Rigid*) 53 Metres (165 Feet)



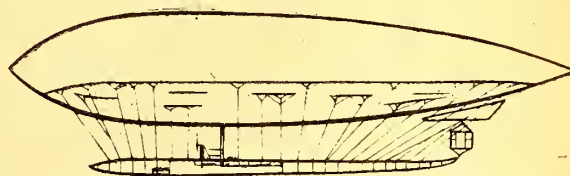
ASTRA-TORRES (*Non-Rigid*) 77 Metres (240 feet)



M.I. ITALIAN (*Non-Rigid*) 53 Metres (260 Feet)



GROSS (*Semi-Rigid*) 97 Metres (300 feet)



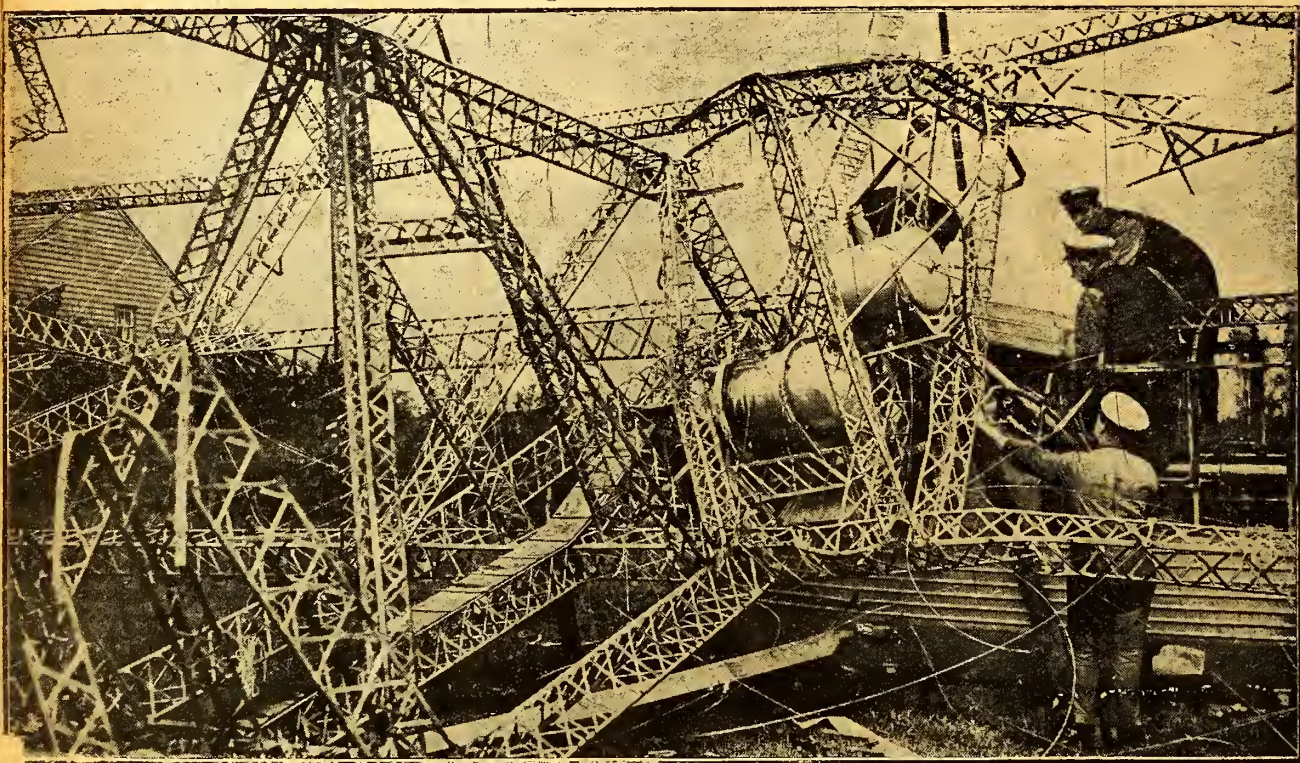
CLEMENT-BAYARD (*Non-Rigid*) 88 Metres (275 Feet)

SRM

Above are seen in profile some of the best-known types of the World's Airships, the sketches showing approximately the relative sizes of the various ships.

ON SOME ZEPPELIN DETAILS.

BY C. G. GREY.



A portion of a wrecked Zeppelin, showing how the tanks are held in position above the gondolas among the girder work. The massive structure in the neighbourhood of the gondola is worth noting.

Thanks to the courtesy of the Air Department of the Admiralty officially, and of Commodore Murray Sueter, C.B., Superintendent of Aircraft Construction, personally, I have been permitted to disport myself at leisure among the remains of an authentic Zeppelin, now resting "somewhere in Essex," next door to the house where the dog had the hair burnt off his back by the fire which wrecked the ship. I trust this very specific piece of geography will not call forth the wrath of the Censor.

One's first sensation on beholding the wreckage is a feeling of awe at its immensity. For once a journalist has told the truth, the notable person being he who said that standing in the wreckage under the girders was like being in the Crystal Palace—the simile being intensified by the presence of sundry affable members of the R.N.A.S., unafflicted by overwork and assisted by the R.N.V.R. in doing it.

Then, as one looks at the huge structure, one recalls a phrase in a certain official document concerning another airship, and one finds oneself unconsciously paraphrasing the Sub-Assistant-Deputy-Director of Deductions, or whoever may have turned out the original priceless effort, and repeating to oneself: "The large amount of aluminium employed in the framework of the Zeppelin is startling and would seem to point to a shortage of wood in Germany."

An engineer friend of mine who shares my old-fashioned dislike of aluminium always refers to that material as "electrified dirt." Not having my tame analyst with me at the time, and being expressly warned that looting of relics is an offence under the Defence of the Realm Act, I am unable to say whether the material used in the Zeppelin is just electrified dirt, or whether it is some subtle alloy unobtainable beyond the realms of Hundom, but ordinary bending tests seem to show that it is fairly tough stuff, very much akin to the Vickers product known as "Duralumin," a material which stands up to aeroplane work far better than one has any right to expect any

aluminium alloy to do. It seems, therefore, that it ought not to be outside our national ability to produce precisely the right material for the building of airships of similar type—if we want to build them and cannot do something better.

OUR ENGINEERING OPPORTUNITY.

And right here let me state, as an expression of personal opinion based on something over 20 years' experience of light structures such as bicycles, motors, and aeroplanes, that if we cannot build something better than a Zeppelin it is time we retired from business as an engineering nation.

The Zeppelin is a hollow fraud, just because it is too solid. Of course one cannot state in print where the defects lie, for to do so would be to present useful information to the enemy, the Hun being, unlike our own official geniuses, the kind of person who welcomes adverse criticism and profits thereby. Doubtless if the Authorities let loose on the design of airships a number of budding scientists who have been brought up on the design of battleships and marine engines, they will eventually obtain an airship of sorts, but its performance will be about as that of a "Tank" is to that of a racing car.

On the other hand, if the Admiralty calls in as advisers a few mere practical people like common aeroplane designers, and experienced works foremen who are used to lightening out material—the kind of man who used to produce a racing bicycle at under 20 lbs. weight, and who is now designing fancy "tin-clips" for aeroplane fittings—they will find that they can get tons of weight out of the standard Zeppelin.

Taking it all round the Zeppelin is moderately well designed as a whole, fearsomely clumsy in its detail design, and most abominably made. And if we cannot beat it in every way, then Heaven help our engineers—always assuming, of course, that our ships are to be built by real engineers and not by enthusiastic amateurs. We

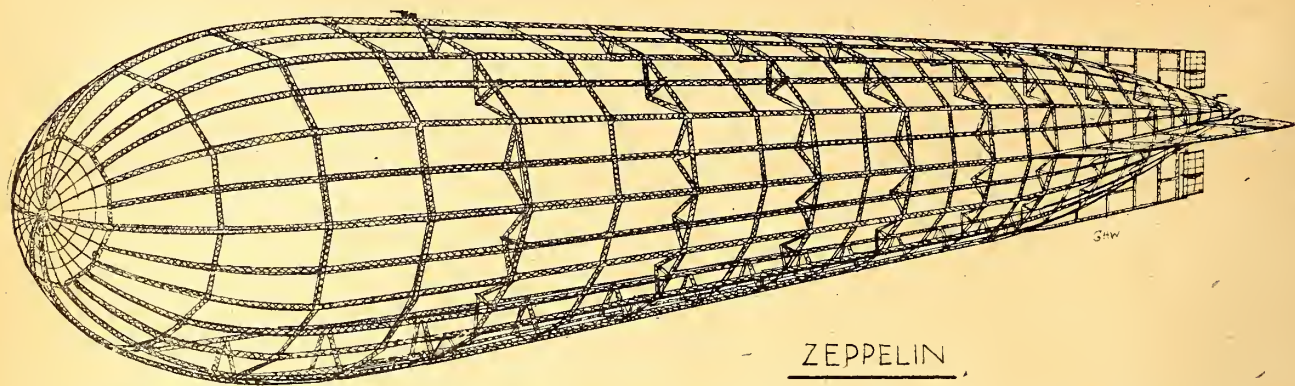
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ZEPPELIN

The General Constructional Scheme of the Zeppelin. The king-posting of alternate girders, aft of the fifth, is worthy of note.

have here the opportunity of a century, for we have most of Germany's experience at our disposal, and all we have to do is to improve on her product, which is as easy as falling off a log.

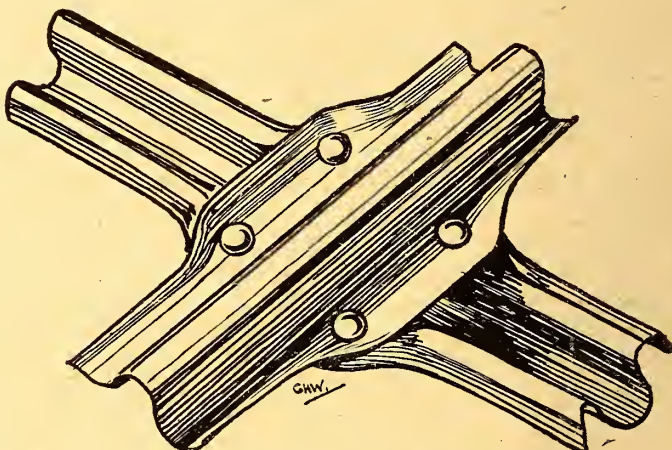
My high respect for the Hun airship has gone. Count Zeppelin's finished article is no more worthy of respect than is the average British Cabinet Minister. The Zeppelin airship is quite a useful weapon, and its military—and naval—value is very high in proportion to its cost. Its performance is good; wonderfully good considering its internal economy. But considered as an engineering job, it isn't up to much. Therefore, if, through the remissness of those whom it hath displeased Providence to set in authority over us, we are eventually "done in" by a Zeppelin bomb, we can at any rate depart this life with the satisfying feeling that after all it was only an accident, and not because the enemy has produced a ship of unbeatable excellence.

Perhaps some of my naval readers, who have seen a great deal more of German submarines in detail than they are ever likely to see of Zeppelins, will understand what I mean when I say that the work and detail design in the "super-Zeppelins" are not unlike those in some of the German "submarine coffins" which have been rushed out during the war. They do their jobs after a fashion, they are not without some good ideas—which could generally be improved with ease—but taking them all-round they give the impression that no nice person would care to have them about the house. They have what used to be called a "Brummagen" appearance before Birmingham took to doing good work. Or, in plain words, they simply shriek "Made in Germany."

After which we may proceed to describe some of the points about the new ships.

THE GENERAL LAY-OUT.

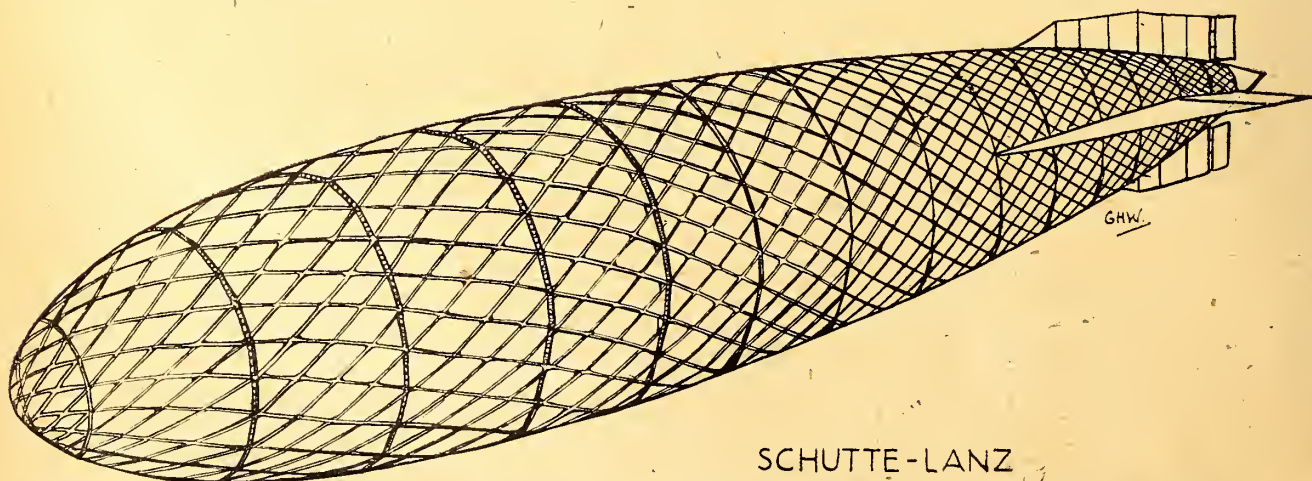
Briefly it may be said that the new ships are of a fairly good streamline shape. This particular ship is said to be 680 feet long. I did not measure it, but probably it is actually 220 metres. Its maximum diameter is officially given as 72 feet, or presumably between 20 and 24 metres. The hull tapers to a sharp point at the tail, and there is no gas-bag aft of the rudder-post, the pointed end being a very light streamline "fairing," riveted or



The method of riveting the Xs. of the girders.

to the last hoop-girder, to which girder the rudder-post and elevator spar are attached—of which more anon.

The construction of the hoop-girders is rather interesting. In the fore part of the ship the hoops are built up of ordinary lattice girders of triangular section, but the



SCHÜTTE-LANZ

The General Constructional Scheme of the Schütte-Lanz, as compared with a Zeppelin, the girder-work being of wood.

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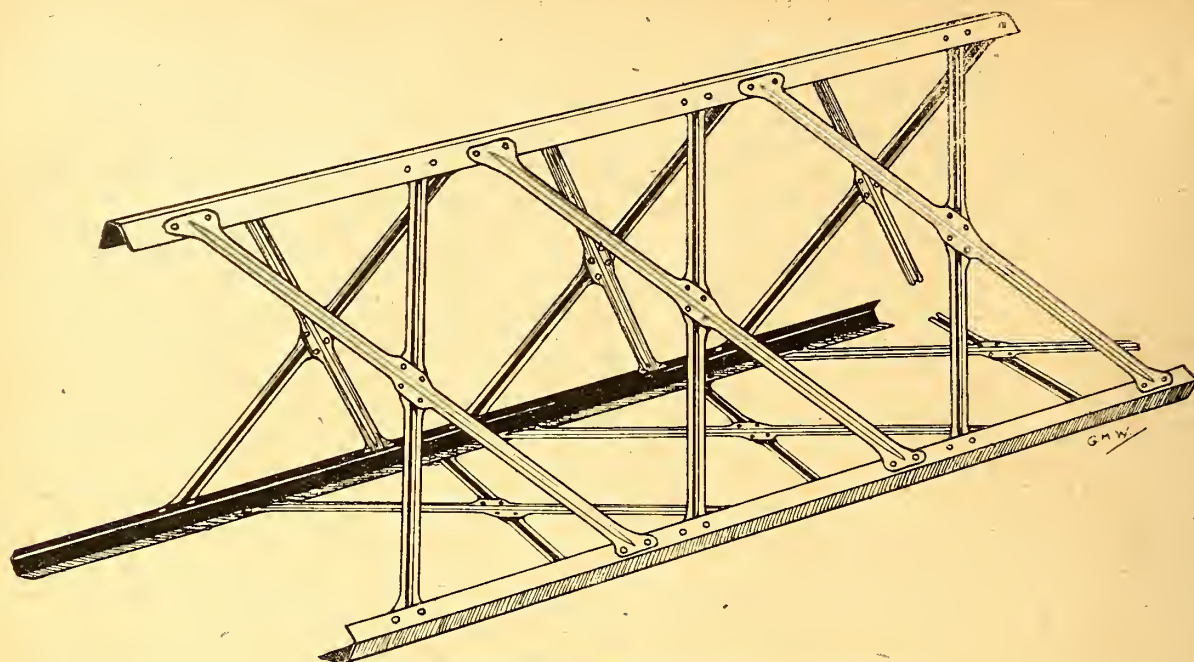
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Portion of a Zeppelin Girder, showing Section of Longitudinals.

fifth hoop from the nose, to which the foremost gondola is slung, is strengthened by a curious "king-post" girder arrangement—as shown in the illustration. Thence afterwards every alternate hoop-girder is similarly king-posted, the plain triangular girders in between acting rather as distance-pieces for the longitudinal girders than as actual ribs for the ship.

The longitudinal girders are of similar triangular section.

The job of joining the triangular longitudinals to the triangular hoop-girders is naturally difficult, but one would hate to tell the Hun any better way of doing them than that which he has evolved. Here and there where particular strains come on the girders, such as places where the cars and propellers are attached, there are extraordinary arrangements of girders inside girders which strike one as being distinctly clumsy, although it must have taken an immense amount of brain-power to work them out.

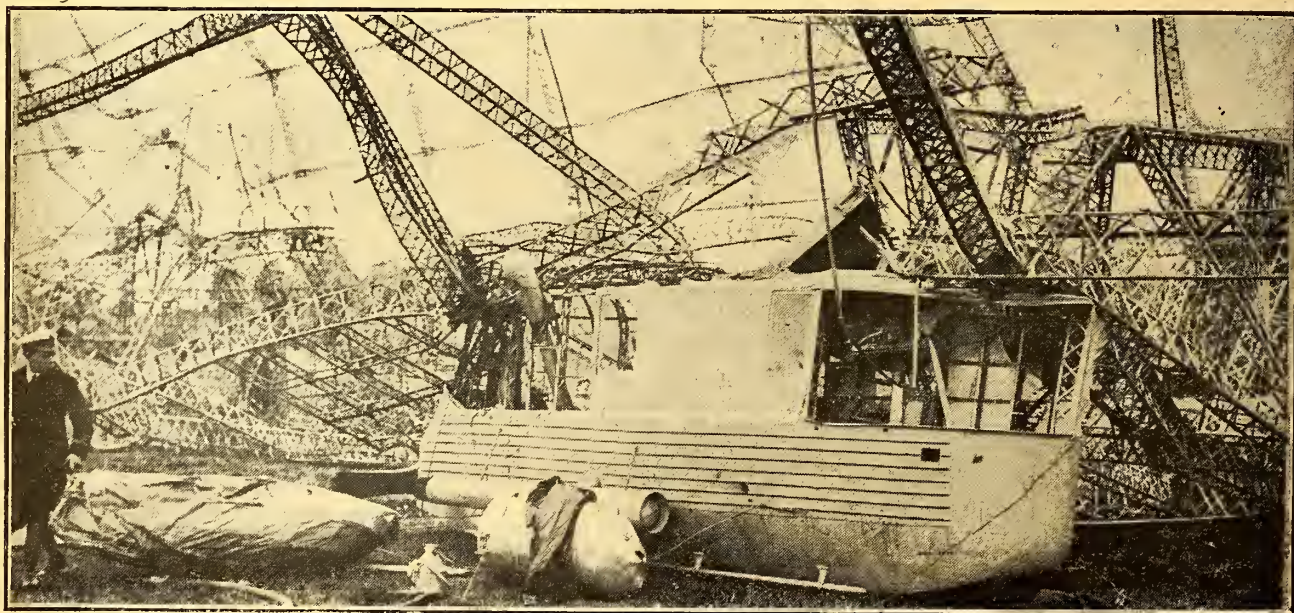
As has been explained elsewhere, the hoop-girders are

stayed athwart-ships by wires like the spokes of a bicycle wheel, but apparently the wires run right across the ship through a central clip instead of connecting separately to a central hub, as one would expect.

THE GIRDER CONSTRUCTION.

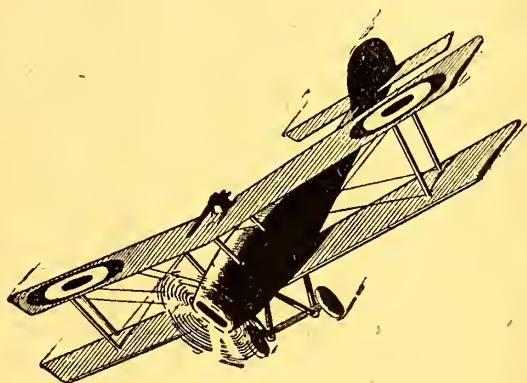
The triangular girders, both for the longitudinals and hoop-girders, consist of channel-strips of aluminium connected to one another by pressed strips of aluminium which form the lattice-work of the girders. These strips are of a special fluted section, flattened at the ends and in the middle. Each pair of strips cross, and the flattened portions in the middle are riveted together so that the whole forms the letter X, the tops and bottoms of the letter being riveted to the channel metal. In order to give the necessary triangular section to the girder the angles of the channel are necessarily greater than a right angle.

Nothing could be simpler or cheaper to make. It has been suggested by one brilliant observer that the riveting seems to have been done by women. Just precisely how



One of the "Power-Eggs" of a wrecked Zeppelin showing the crank-case ventilator, and machine-gun window. Part of the radiator is seen amidships of the top of the car.

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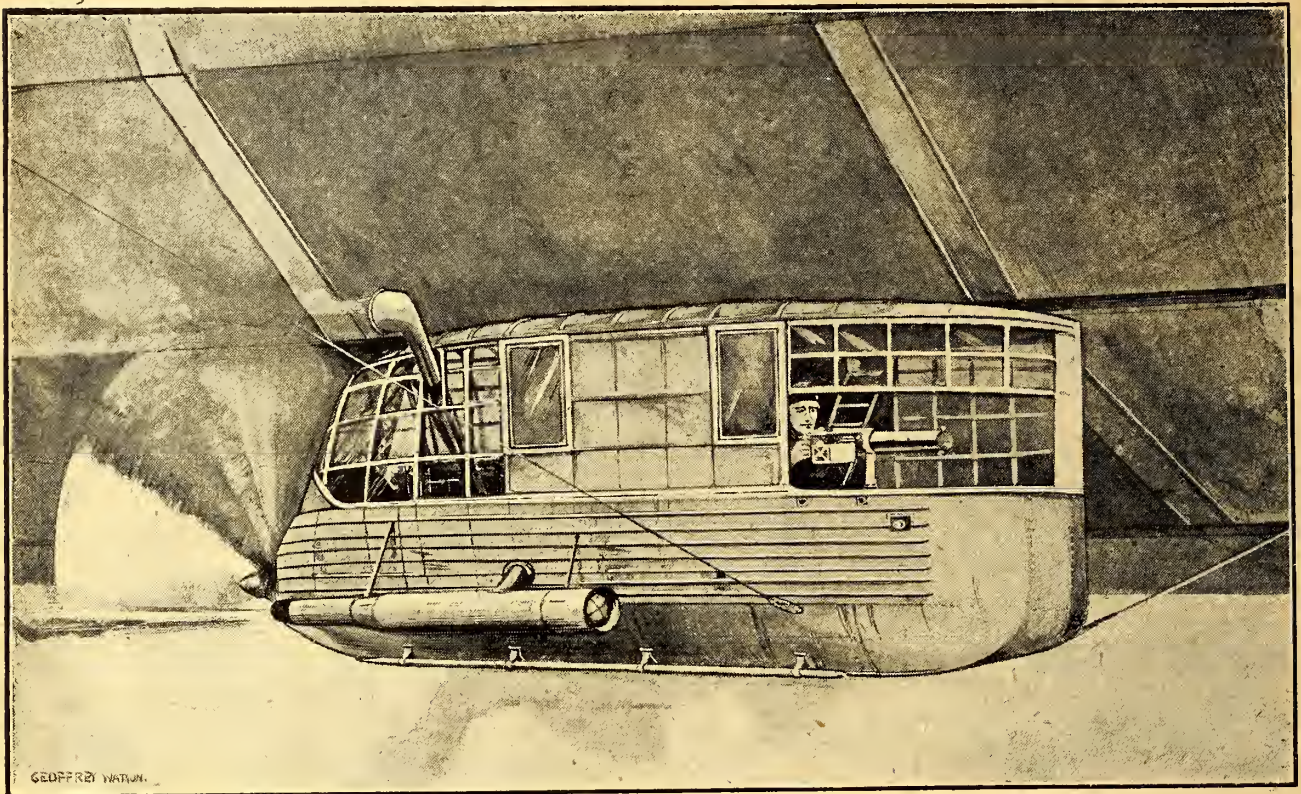


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A Sketch of an undamaged "Power-Egg" showing the machine-gun in position.

he arrived at this conclusion does not appear, but from the absence of hammer marks, and the state of the rivet heads, one assumes that the riveting is done by some form of power machine. It is obviously clumsily done at that, and one quite understands how the legend arose that in the earlier passenger-carrying ships a man used to walk along the keel after every long trip with a dustpan and brush to sweep up the rivets which had fallen out!

THE KEEL AND CAT-WALK.

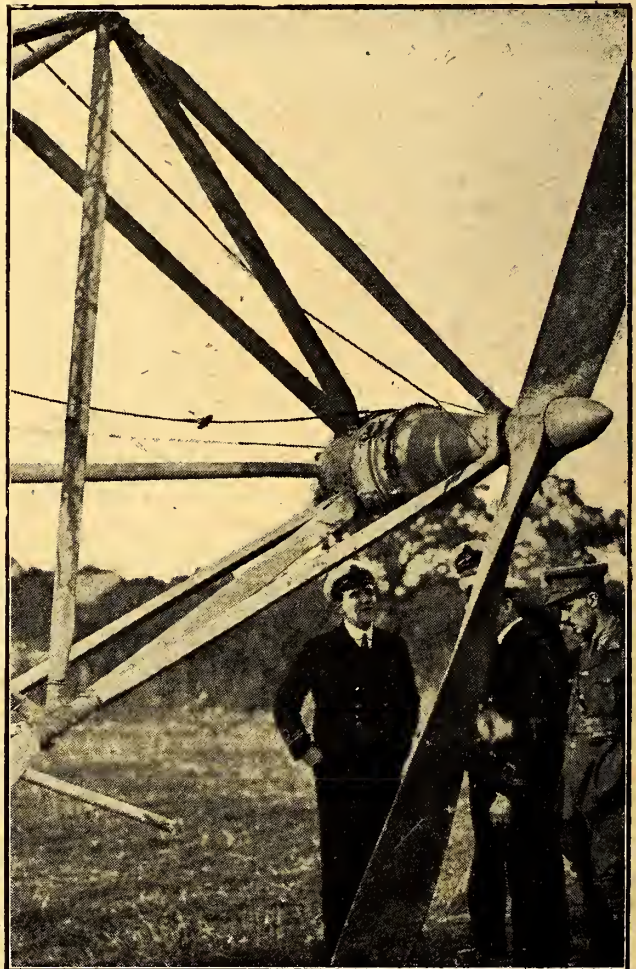
Unlike the old ships, in which there was a V-shaped keel underneath the envelope, the new ships have a flat bottom, the bottom constituting one of the 25 sides of the ship. The keel is built up inside the hull so as to form an inverted V over the flat bottom section. This inverted keel not only strengthens the ship but forms a passageway inside to facilitate communication between the different cars. The actual footway itself consists of very thin three-ply boards laid on top of one of the longitudinal girders. Obviously there is some form of hand-rail as well, otherwise a false step would land one over the edge of the "cat-walk"—as our people call it—and through the fabric into space.

Owing to this inverted keel the gasbags are of necessity the shape of cheeses with a section cut out, the keel occupying the position of the cut-out section. It seems possible that in inflating the ship the gasbags are only partially filled with hydrogen, and that the bifurcated portion below is left hanging over the "cat-walk," and so leaves room for the hydrogen to expand as the ship rises to higher levels.

CARS AND PROPELLERS.

Naturally, the most interesting things about the ship to those concerned with war flying are the arrangement of the cars and the armament. The new Zeppelins have four cars with six engines and six propellers.

The engines are alleged to be of 240 h.p. each, though to me they look rather small for their power, especially as they do not seem to be designed for very high speeds, driving, as they do, very large propellers—four of them "pushers." At the same time it must need all of their



One of the side propellers, showing the streamlined gear-box, and the three-ply streamlining of the struts.

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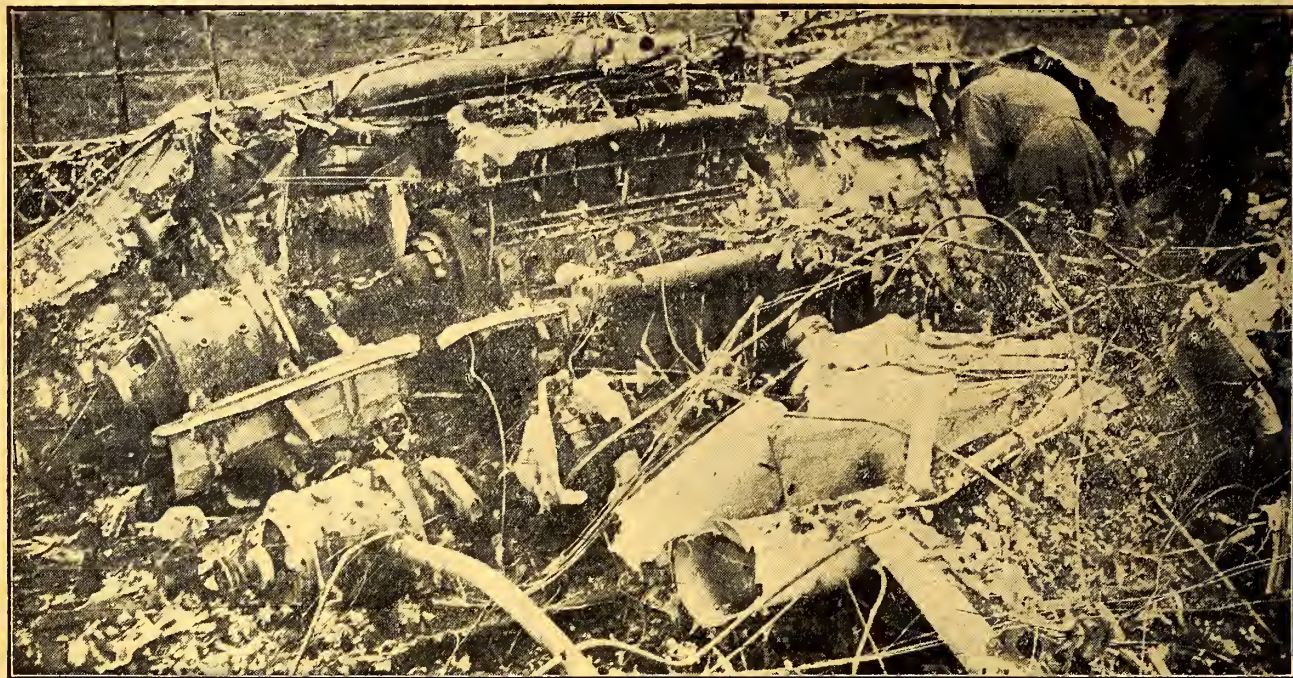
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The disintegrated rear car of a Zeppelin—after being dissected by various inspections. The engines of the side propellers are seen, with the gear-boxes and one propeller shaft. The end of the exhaust-box and a corner of the radiator may also be seen.

1,440 h.p. to get any speed on the ship, and apparently the new ships are really quite fast, if one is to judge from what one hears from those who have chased them.

The forward car, which is the control car, has a single engine at the stern driving an ordinary pusher. This car is situated under the 5th hoop-girder of the frame, and is therefore very far forward. This girder, it should be noted, is the first of the king-posted girders.

As the stern carries a good deal of dead load in the form of elevators and rudder and streamline fairing, and as it tapers considerably from the maximum diameter of the ship, it is apparent that the gas contained in the major portion of the stern merely suffices to lift the structure of the vessel itself, hence the rearmost car is situated a good 200 feet from the extreme stern of the ship, or very nearly one-third of the way forward.

This car contains three engines. One jammed right up in the stern drives a geared-down "pusher." The other two engines each drive a propeller placed high up on the sides of the ship. There is a bevel gear-box coupled to each engine shaft, and another bevel gear-box carrying the propeller, a tubular shaft running between the two sets of bevels.

The bracket arrangement which carries the propeller bevel-box is quite sufficiently elaborate, and the various members of the bracket have been carefully streamlined. The fixing of these brackets to the hull also necessitates a considerable amount of extra girder-work internally, the design of which shows considerable assiduity, if not ingenuity.

PROPELLER EDGING.

An interesting point about the propellers is that the blades have metal edges for a considerable distance from the tip towards the boss, to prevent the edges of the blades from becoming frayed by rain or other liquid or solid matter. The blades are not actually metal sheathed, as is the custom with seaplane propellers, the edging being only a matter of a couple of inches wide, and in order to prevent this edging from flying off owing to centrifugal force a wire is fixed to the edge and is carried along the blade, embedded in the wood, to the boss, and thence out to the edging of the opposite blade. This occurs on both sides of the blades, so that the pull of the edging of one blade balances the pull of the edging of the other.

One ingeniously-minded individual who saw this wire suggested that it was intended as a lightning-conductor in case the ship ran into a thunder storm, though precisely where, whence and whither the wire was supposed to conduct the lightning he did not explain. Possibly he expected the lightning to strike the ship, run along the engine shaft to the propeller boss, and thence to be diffused into the atmosphere by the centrifugal force of the propellers!

THE ENGINES.

The engines themselves are all of the recognised Maybach type with three inlet valves and two exhausts to each cylinder. The three inlet valves are all operated by a single rocker and push rod, and similarly with the two exhausts.

A rather interesting piece of design is the method of keeping the big-end and crankshaft bearings cool. Outside the car, low down, and facing forward, is fitted a small ventilator cowl which scoops air into a big manifold placed level with the crankcase inside the car. From this manifold smaller pipes lead into the crankcase, one hole being opposite each crank-throw as seen above.

On the opposite sides of the crankcase similar pipes lead into a similar manifold inside the car, and from this manifold a long pipe, which increases in diameter as it ascends, leads to a similar ventilator cowl facing backwards. In this way cool air is forced by the speed of the ship into the crankcase and out again the other side. The more work the engines are doing the hotter they get, but also the greater the speed of the ship through the air, and the greater the amount of cool air forced through the crankcase, so that the cooling effect increases with the amount of work the engine is doing.

Evidently the Germans set considerable store by keeping their engines cool when running, for the oil used in lubricating the engine is passed through a small honeycomb radiator placed high up outside the car. One gives the Germans credit for knowing quite a lot about internal combustion engines, judging by the wonderful reliability their car and aero engines have shown, so that the idea is worth considering.

The radiators for cooling the water round the cylinders are of very great size, and are stuck up above the gondolas, where they get the full effect of the ship's speed

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through the air—and incidentally create the maximum head-resistance.

Between each engine and its bevel-box, and also between the pusher engines and their propellers, there is a hand-operated clutch and band-brake, so that the engine can be run without starting the propeller. The brake is doubtless fitted so that there will be no fear of the propeller swinging round and damaging any of the landing party, or of digging its points into the ground when the machine is actually brought to earth.

WHERE TO AIM.

In the case of all the cars the petrol tanks are carried inside the hull of the ship and well away from the engines, evidently so that if a petrol tank is punctured by hostile fire there will be no fear of petrol drifting into the engines and catching light. The point is worth noting by young officers attacking airships, who may be tempted to keep on firing into the gondolas in the hope of setting the ship on fire by perforating a petrol tank. Their best game is to fire into the hull of the ship just over the top of the gondolas. They will then be much more likely to puncture a petrol tank and set fire to it, no matter what type of ammunition they may be using, than by firing either at the gondolas or the gasbags.

THE POWER-EGGS.

The after gondola, which we have been discussing hitherto, though most of its points refer equally to the other gondolas, is somewhere about 45 feet long. About 75 feet forward of it are placed two small gondolas, each containing an engine, and apparently one man to look after it. These little gondolas are fixed by aluminium girder-work to the sides of the ship about level with the top of the inverted keel, and on about the second longitudinal girder from the bottom of the ship, which position raises them considerably above the two other gondolas. Each of these gondolas has a ladder-way into the hoop-girder to which the bow is fixed, and down this hoop-girder runs a "cat-walk" which communicates with the main "cat-walk" inside the keel, so that the men in the gondolas can get back into the body of the ship, or can be reached from the body of the ship, without going into the open air. As the illustration shows, these gondolas are carefully boxed in, and must be quite comfortable places of residence until attacked.

There is quite a long distance separating these gondolas—or "power-eggs," as the Naval Air Service calls them—from the forward car, and in that space, which includes the precisely midship section, is fixed the bomb-dropping gear.

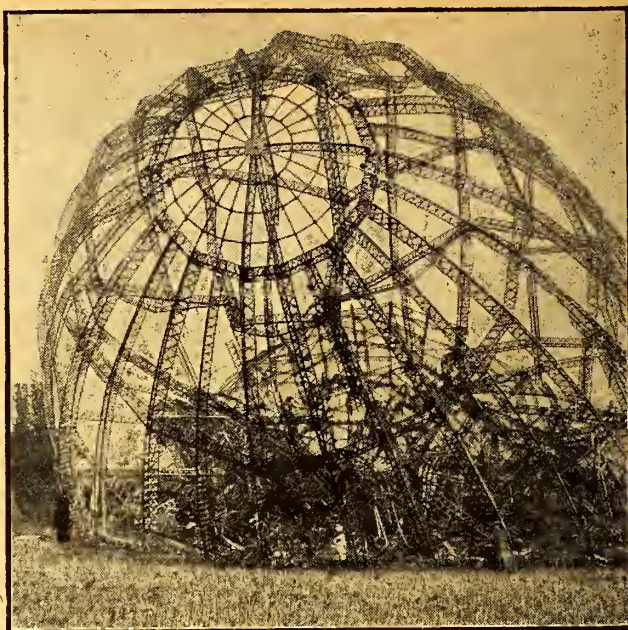
ACCESSORIES BEFORE THE FACT.

Precisely what arrangements are made for bomb-sighting was not apparent in the wreckage as I saw it, but, as both the older Services and all their various auxiliary Services had busily collected souvenirs from the wreck, quite a number of interesting parts were also missing.

For instance, I saw nothing of the numerous dynamos of which some newspaper people made such capital—in fact, I am strongly under the impression that, instead of there being a dynamo to each engine, as certain people seem to suppose, there was probably one dynamo in each of the main cars, and that the things they took for dynamos were really the gear-boxes and clutch-boxes of the motors.

The foremost gondola, of course, contains most of the interesting things, but these had all vanished by the time I got there, though in any case most of the fittings would be very much too elaborate to describe in an article of this scope. If one wanted to deal with all the details of a Zeppelin properly, one would have to write a very large book on the subject.

One learns, however, that the bombs are dropped



The Bow of a Zeppelin, showing the run of the Girder work.

electrically on the principle that the commander presses the button and the bomb does the rest. The bombs would naturally be carried amidships, so as not to shift the centre of gravity of the ship whether the bombs were released either one at a time or a ton at a time.

CONTROL GADGETS.

The actual controlling of the ship is all done from the forward car, and is apparently worked by ordinary hand-wheels and cables running the full length of the ship inside the "cat-walk." The rudders and elevators are both operated in precisely the same manner, the cables running from the hull of the ship to pulleys on the trailing edge of the vertical or horizontal fins, and thence to the levers on the rudders or elevators, as the case may be. These levers are constructed, as shown in the illustration, to form practically a wheel round the rudder post or the elevator spar, as the case may be. The periphery of this wheel forms a deep channel, and in these channels the cables lie, so that as the axis of the controlling plane revolves the cable is held by that channel and always follows a circular path, neither shortening nor lengthening as the plane moves.

The tail and rudder arrangement of the new ships is now perfectly cruciform. That is to say, there is a rudder above and below the pointed tail, with a fin in front of each, and there is an elevator on each side with a fin in front of each, the rudders and elevators being of precisely the same area. Both rudders and elevators are "balanced," to reduce the manual work.

One speaks or writes of the rudders and elevators as being single-surfaced, in that they operate as a single surface instead of being a series of different planes like the old biplane and quadruplane elevators and rudders tried on some of the earlier Zeppelins. In actual fact, however, these control planes are not single-surfaced, because they consist of a series of girders covered by fabric on both sides, the girders fulfilling the same functions as the ribs in an aeroplane's wings.

ARMAMENT.

Actually the armament of the new ships seems to be somewhat a matter of dispute. It is, however, certain that each of the "power-eggs" carries a machine-gun forward, so that the engine mechanic may protect himself if attacked. There is also an emplacement for one machine-gun built into the streamline fairing at the extreme end of the ship. This machine-gun is actually placed aft of the trailing edge of the rudder, and one

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imagines that the gunner must feel fairly lonely 200 feet away from his fellow-men, and with nothing moving except the great rudder creaking to and fro within a few inches of his head.

It is when one pictures to oneself that lonely little man sitting up all by himself in the blackness of the night, with nothing to do except watch, that one begins to realise the nerve required of a Zeppelin crew, and when one thinks of even the other men, who have one another's company to keep their hearts up, cruising about over more or less accurate gun-fire, and vigorously sought for by aeroplanes of superior speed, knowing that they are supported only by those hundreds of thousands of feet of highly inflammable gas, one's respect for their bravery rises quite considerably.

It is not even materially decreased by the stories one hear of the evidence which hypodermic needle-pricks give that the crews are pretty heavily doped either before or during their voyages.

However, to return to the machine-gun question, it is evident that there is a machine-gun emplacement for two guns right on the top of the envelope over the forward gondola, and in the wreckage one can plainly see the vertical tunnel leading from the "cat-walk" over the gondola up to the roof girders. It is said that the two roof guns and the tail gun are of heavier calibre than ordinary machine-guns, but it occurs to one that the solid structure of the gondolas, backed by the mass of the engines, would probably make a better emplacement for big-bore guns than flimsy roof girders.

CREW.

However that may be, we can account for 5 machine-guns between the roof, tail, and "power-egg" emplacements, and one may assume that there are at least 2 machine-guns in each of the big gondolas, which would

make 9 machine-guns all told. This would require 9 men at least; 6 engine mechanics would make 15; there would probably be a couple of men on the elevator wheel, and a couple of men on the rudder wheel, either singly, with a relief, or working in pairs.

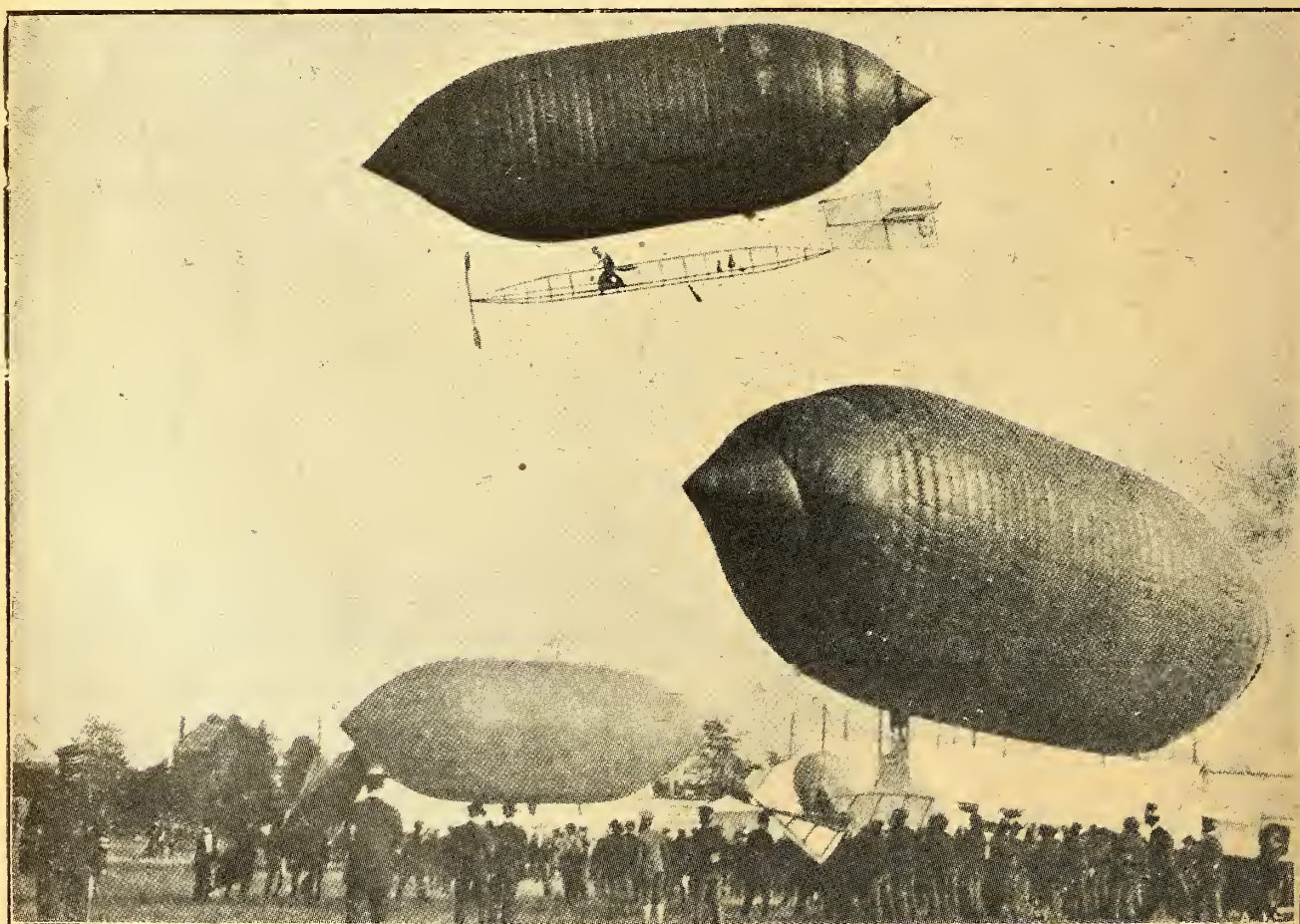
This would make 19 in all, after which one would have the skipper, the second-in-command, and a wireless operator to make up the 22 which seems to form the average Zeppelin crew.

Doubtless, however, a number of these jobs are interchangeable. For example, the "power-egg" mechanics would probably operate their own machine-guns, and very probably one of the control-gear hands would also be a relief wireless operator.

If I might make a suggestion to the Naval authorities who now control the airship, it is that a note should be sent to all aircraft constructors, inviting them to allow their draughtsmen and designers and shop-foremen, if they care, to go to see the wreck of the Zeppelin, on the condition that, if any suggestions for the improvement or general design occur to the said aeroplane constructors, those suggestions shall be sent forthwith to the department at the Admiralty which is charged with the construction of airships.

I feel certain that in this way an enormous number of very useful suggestions for improvement in construction would be received, for I cannot believe that any aeroplane designer, or even any first-class aeroplane mechanic, can go through what is left of the ship without finding a dozen points on which he could suggest improvements.

Finally, I desire to express to Commodore Sueter and to the Air Department at the Admiralty thanks on behalf of our artist, Mr. Geoffrey Watson, and myself for permission to inspect the ship in detail.



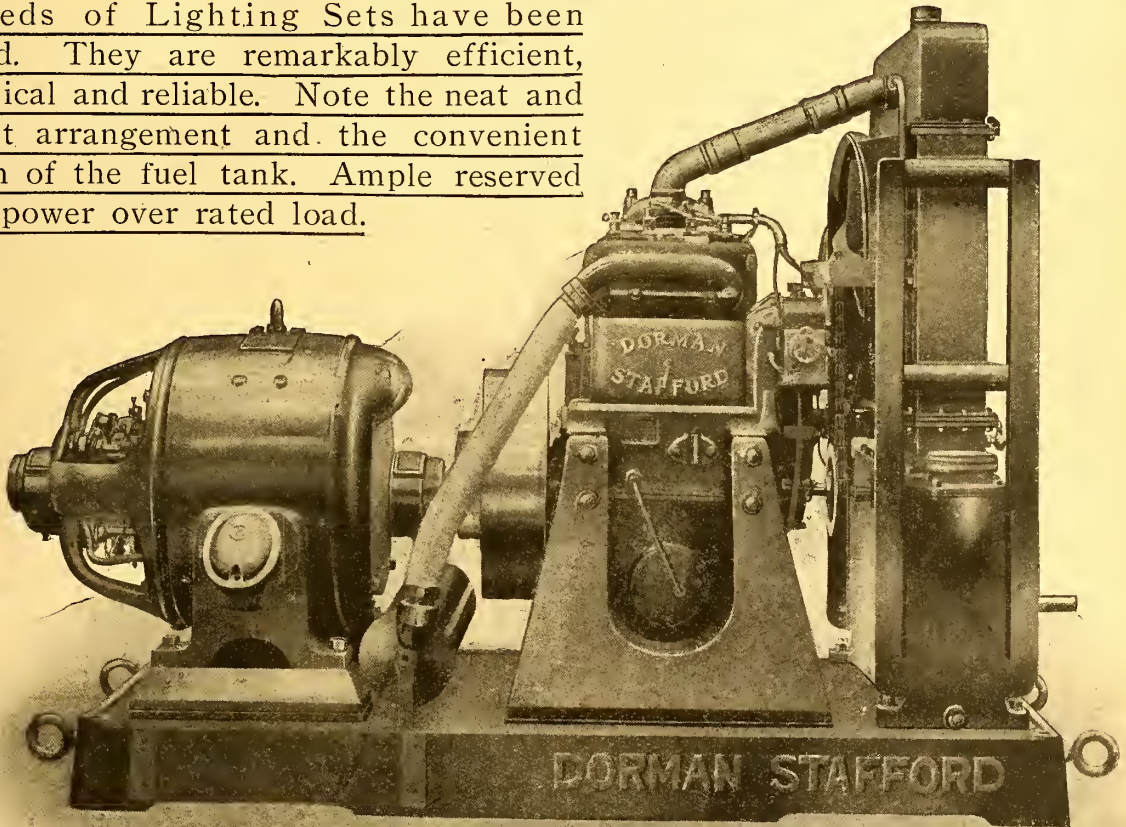
COMIC RELIEF.—An ancient photograph of an early American attempt to produce airships. The occasion was an "airship race," and the uppermost performer was built by the late Lincoln Beachey.

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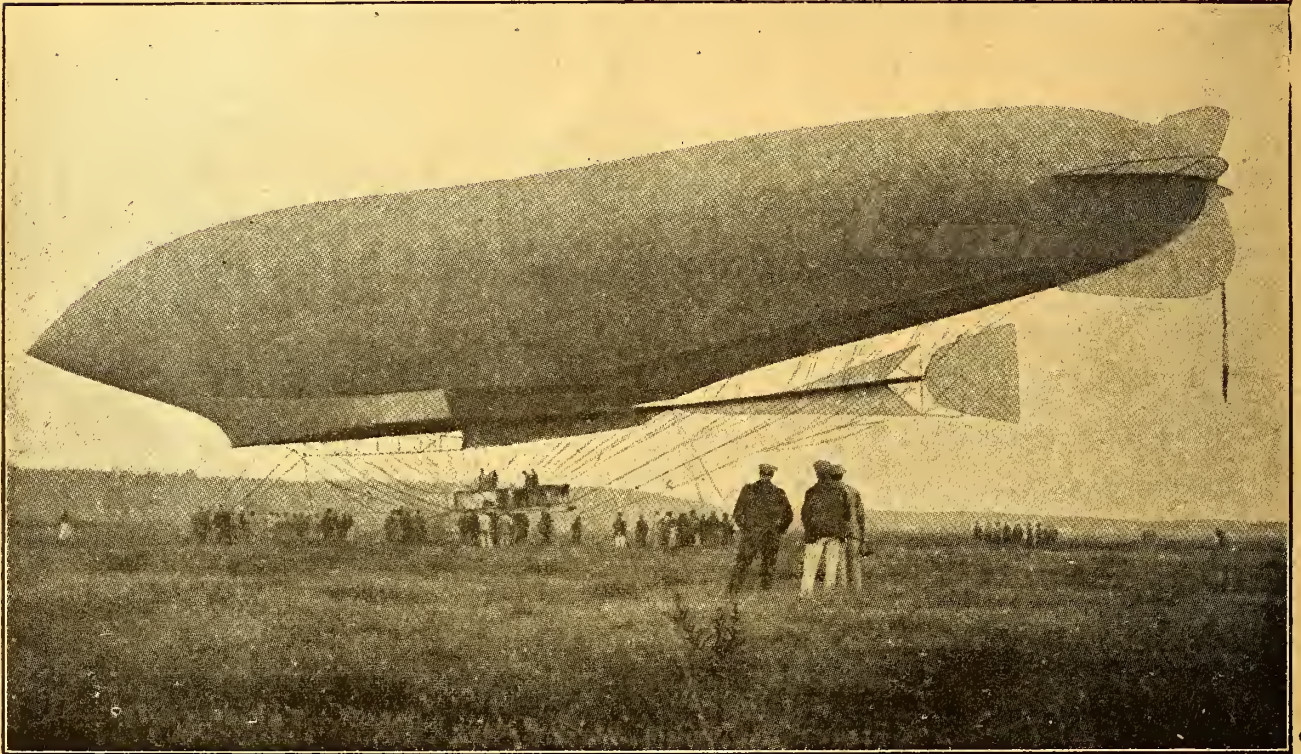
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A SHORT HISTORY OF THE AIRSHIP.

BY W. L. WADE.



"La Republique."—The large Lebaudy Semi-Rigid Airship which performed well in 1908-9.

In THE AEROPLANE of Sept. 13th appeared a short article on "Early Efforts in Airships." The present article carries history on from that time, and covers the period in which lighter-than-air craft became of some practical military value.

It is so difficult to make a concurrent record of the development of the rigid airship and the non (and semi) rigid airship that the writer has decided to give up the attempt and to deal with the two main classes separately. To France credit is chiefly due for the non-rigid—to Germany for the rigid.

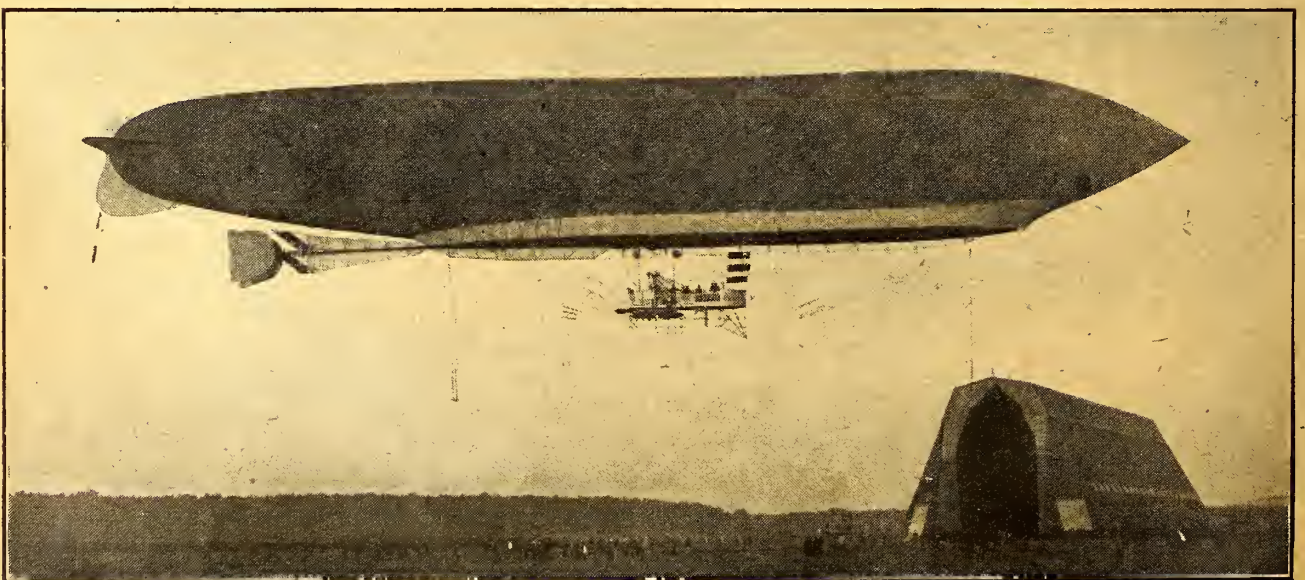
THE NON-RIGID AIRSHIP.

As an airship is *ipso facto* dirigible to a certain extent, if it flies at all, and as an aeroplane is even more so, and because a free balloon is not an airship at all, it is not proposed to refer to lighter-than-air craft of any kind as "dirigibles," as that is an implied insult to their achievements.

In 1899, the Lebaudy brothers, French sugar refiners, were moved to attempt the construction of a large airship. With the assistance of their chief engineer, M. Julliot, and a balloon manufacturer of Billancourt named Surcouf, they turned out an airship with a petrol motor which was sufficiently successful when launched in 1902 to encourage them to name it "Jaune" and continue their experiments.

The second airship, named "Lebaudy," was still better, and after passing certain tests was accepted by the French Government. Thereafter airships of this type were rapidly turned out at Moisson and passed into the Army.

The Lebaudy airships were of the semi-rigid class, with a long spar running almost the whole length of the envelope. This spar was attached so that the load was evenly distributed over the delicate surface of the gas-bag or envelope. From the spar the car containing engines and crew was hung, and at its rear end,



The Lebaudy Airship, "Selle de Beauchamp," a successful effort of 1912.

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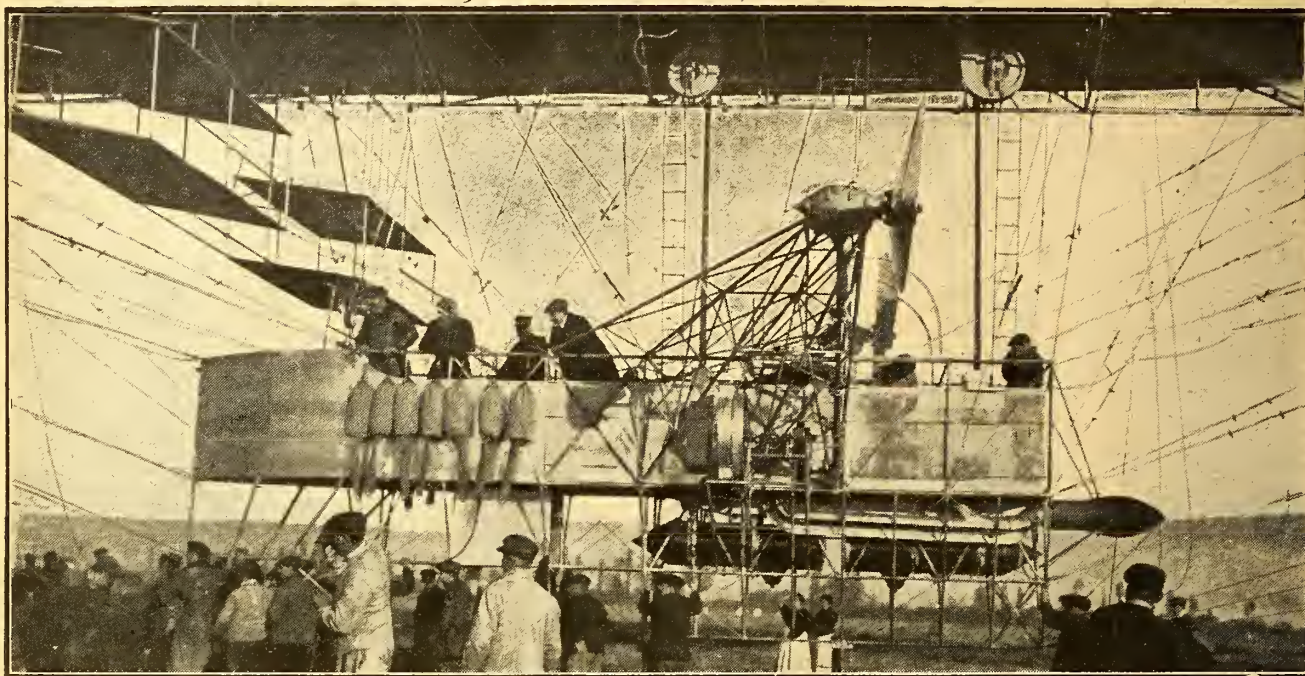
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The Car of the "Selle de Beauchamp."

which protruded free from the tail of the airship, were horizontal and vertical fins for stabilising purposes.

To return to the "Jaune," who took her name from the colour of her envelope, which was treated with yellow lead chromate to ward off the actinic rays of the sun from the rubber underneath, and so prevent deterioration. She was 183 feet long, 30 feet maximum diameter and of 80,000 cubic feet capacity. She was propelled by twin screws driven by a 40 h.p. Daimler motor and attained a speed of twenty-six miles an hour.

During her first year's service in 1902 she made 29 flights and returned 28 times to her starting place. On the final trip, however, in November, 1902, she hit a tree and was wrecked.

The "Lebaudy" came out in 1904, with various improvements. She was 190 feet long and contained 94,000 cubic feet. She had a triple air bag (or ballonnet) of 17,500 cubic feet, which was kept inflated by a rotary fan driven from the motor.

This airship was taken over by the French Government after passing many exacting tests, the fulfilling of which entailed seventy-six voyages and a fairly comprehensive smash.

The "Patrie" and "République" were larger and still more improved editions of the same type, which performed well between 1906 and 1909. They had a speed of about 28 m.p.h. and a radius of action of 280 miles with a crew of nine men. The end of both was unfortunate.

In the winter of 1907 the "Patrie" was anchored out in a gale at Verdun, and broke away from her mooring ropes and some 200 soldiers who were trying to hold her. The ship travelled over France, England, Wales and Ireland, shedding a few fragments on the way, and disappeared into the Atlantic.

The "République," which had an 80 h.p. motor as opposed to the 60 h.p. engine of the "Patrie," did well from July, 1908, to September, 1909, but finally came to grief through a propeller breaking in the air. A blade flew upwards and tore a huge gash in the envelope, and the airship fell, killing the two officers and two N.C.O.s. who were in her at the time. The tragedy happened during the Paris Aero Show, and cast a gloom over the affair, for in those days people were not used to wholesale deaths in the air.

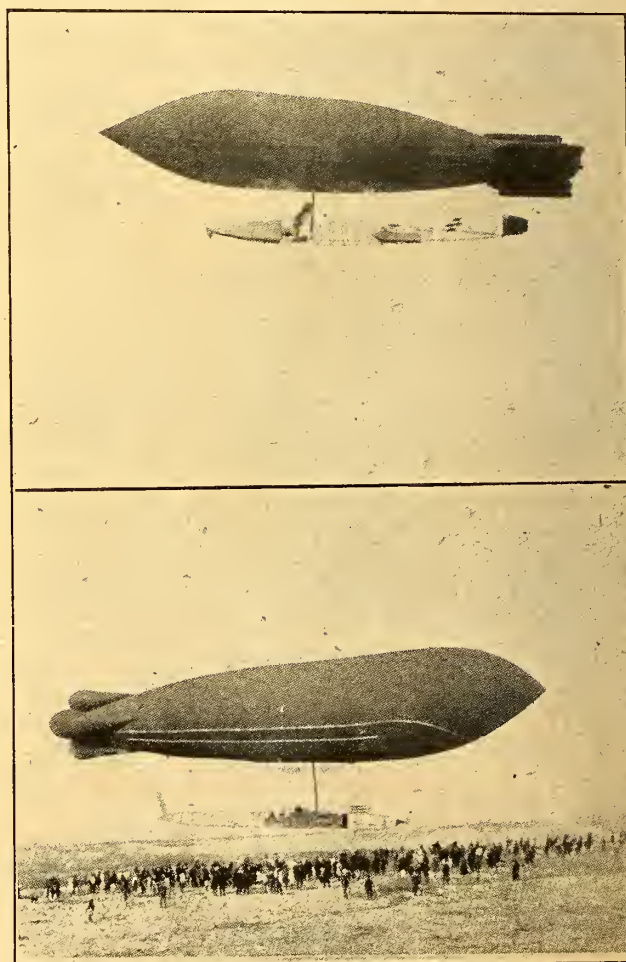
The Lebaudy firm produced two more ships in 1909 known as the "Russie" and "La Liberté," built respectively for Russia and France.

THE EARLY CLÉMENT-BAYARDS.

The loss of the "Patrie" caused M. Deutsch de la Meurthe to have a non-rigid airship, based on the plans of Col. Renard, built by the Astra Company in conjunction with M. Clément, the famous motor manufacturer.

This ship he placed in the hands of the military authorities—she was named the "Ville de Paris," was 200 feet long, and contained 120,847 cubic feet. She had a vertical and horizontal empennage (or fin arrangement aft) formed of cylindrical gas chambers added to the top and bottom and sides of the tail, and a long open fuselage running underneath the envelope for three-quarters of the length carrying the main loads. The engines, tanks and car were distributed fairly evenly along it to avoid the concentration of weight, as in the single car of other non-rigids. This girder was suspended from the envelope by perpendicular cords

attached to broad canvas bands. Elevator planes were attached to the top of the girder to raise or lower the airship, aeroplane fashion. A vertical rudder at the extreme end of the girder steered the vessel. With a 70 h.p. motor this ship only did 25 m.p.h., but she was very stable and airworthy.



Above:—The "Ville de Paris," the first Clément-Bayard airship.

Below:—The "Clément-Bayard," a later ship.

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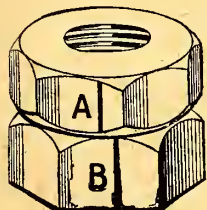
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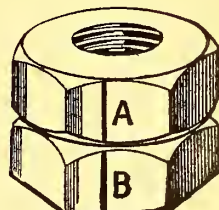


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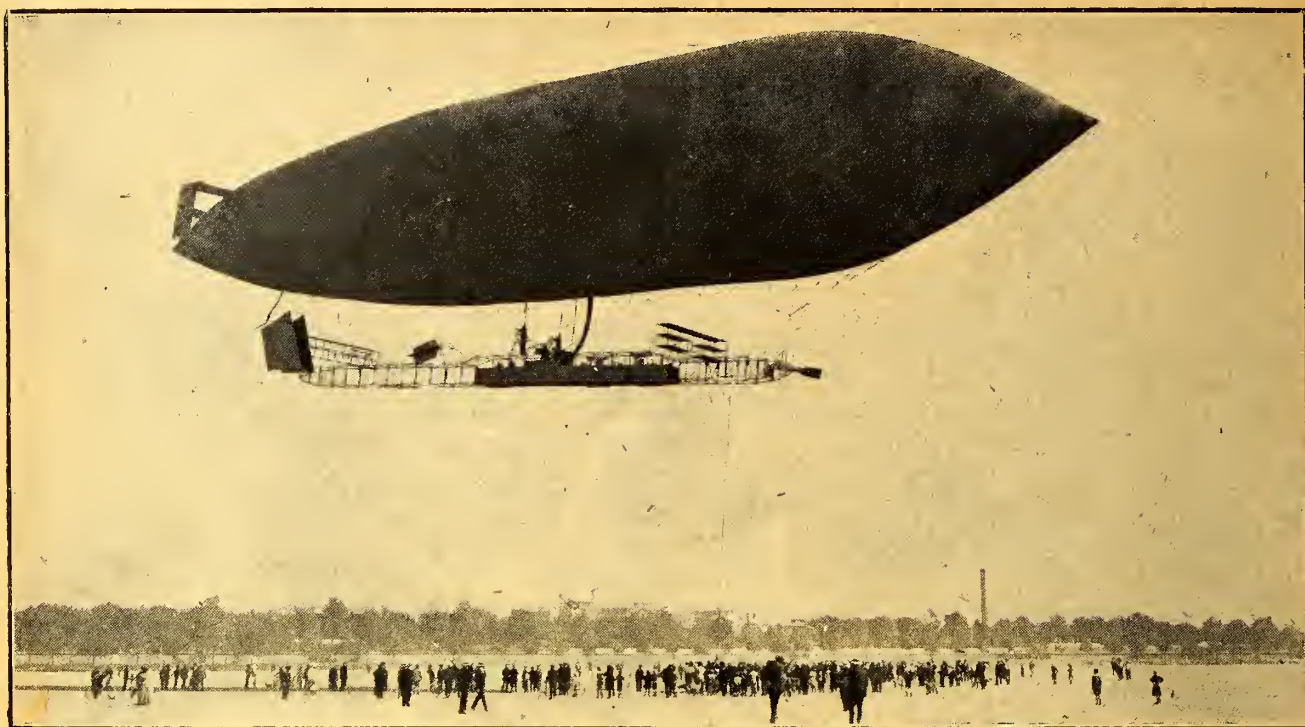
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The Clément-Bayard "Adjudant Réau"—built in 1911.

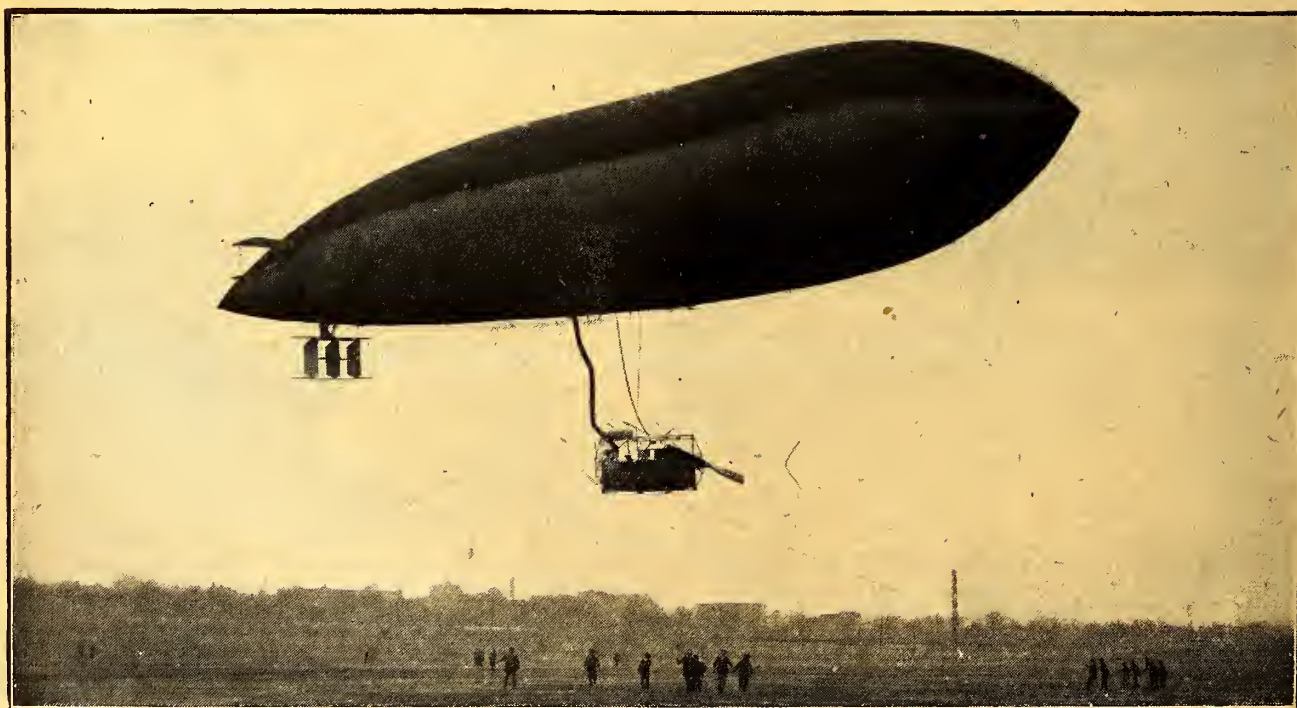
The "Ville de Paris" was followed in 1909 by the "Clément-Bayard," a slightly larger vessel on similar lines. The envelope of this ship was also built by the Astra aeronautical establishment under the supervision of M. E. Surcouf and was intended for the Russian Army. Pear-shaped stern ballonets were substituted for the cylindrical ones used in the "Ville de Paris" as empennage with the blunt ends pointing rearward, and consequently exerting considerable drag as the airship travelled through the air as they had obviously an anti-streamline effect, but as stabilising devices they were very effective.

Like the "Ville de Paris" the "Clément-Bayard" had a long suspended fuselage with the engine and propeller in front and accommodation for the crew farther back. The airship was driven by a Clément-Bayard motor of 100 h.p., which gave the ship a speed of thirty miles an hour. During its acceptance tests on August 23rd, 1909, it flew for two hours at a height of 5,000 feet (a record for that time), but it was caught by a squall during the landing operations and torn from the hands of the landing

party and fell into the Seine, whence it was rescued somewhat damaged after considerable trouble.

Other vessels built by the Astra Society were the "Ville de Bordeaux," 3,300 cubic metres; "Ville de Nancy," 3,300 cubic metres; "Colonel Renard," 4,000 cubic metres; "España," 4,000 cubic metres, "Clément Bayard II.," 6,500 cubic metres; "Trans-Aérinne I.," 6,500 cubic metres, and "Flandre," 6,500 cubic metres. All these airships performed very well, some of them as military ships and one or two as private passenger vessels.

The later vessels built by the Astra Company are of a peculiar design, introduced by a Spaniard, Señor Torres. The envelopes are of trefoil section with two lobes side by side and a third overhead, giving a general impression of a bunch of three bananas. The suspensory cables to which the car was hung depend internally from the junction of the lobes, and the arrangement makes a very sound job. The more advanced types have two propellers and are very fast. These ships are known as the Astra-Torres type.



One of the early Astra-Torres ships of trefoil section.

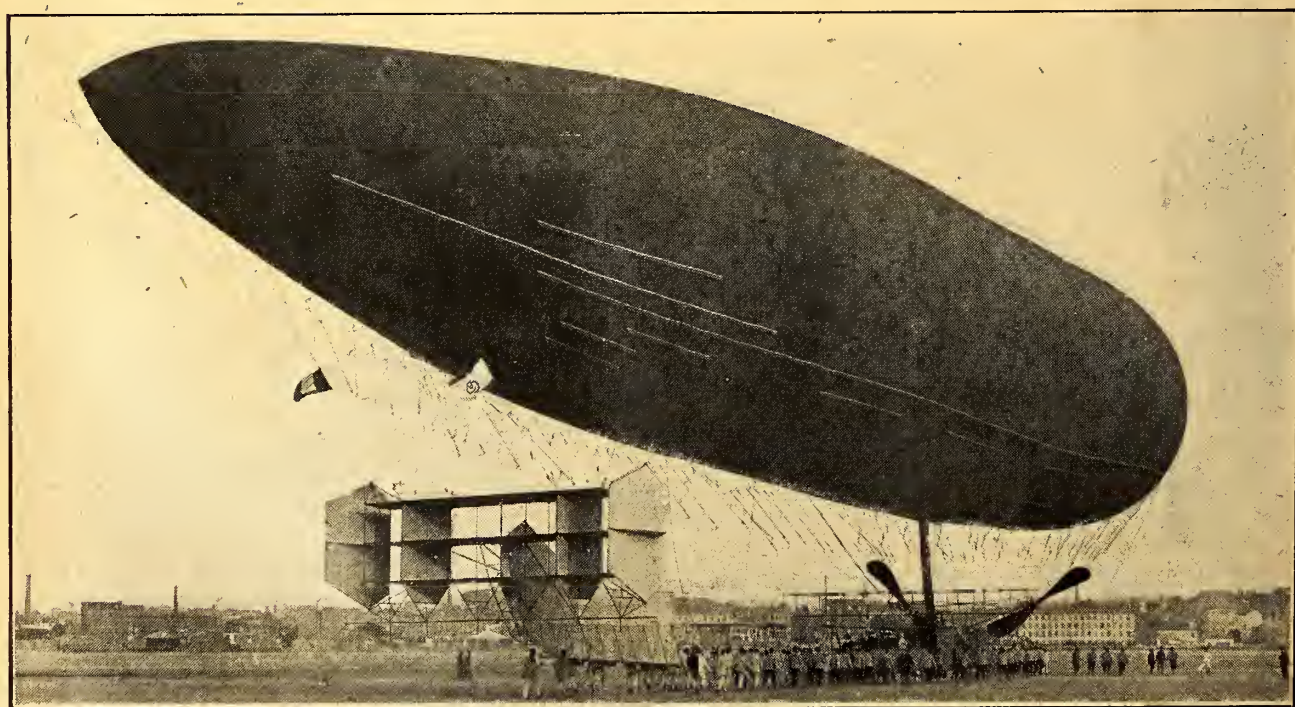
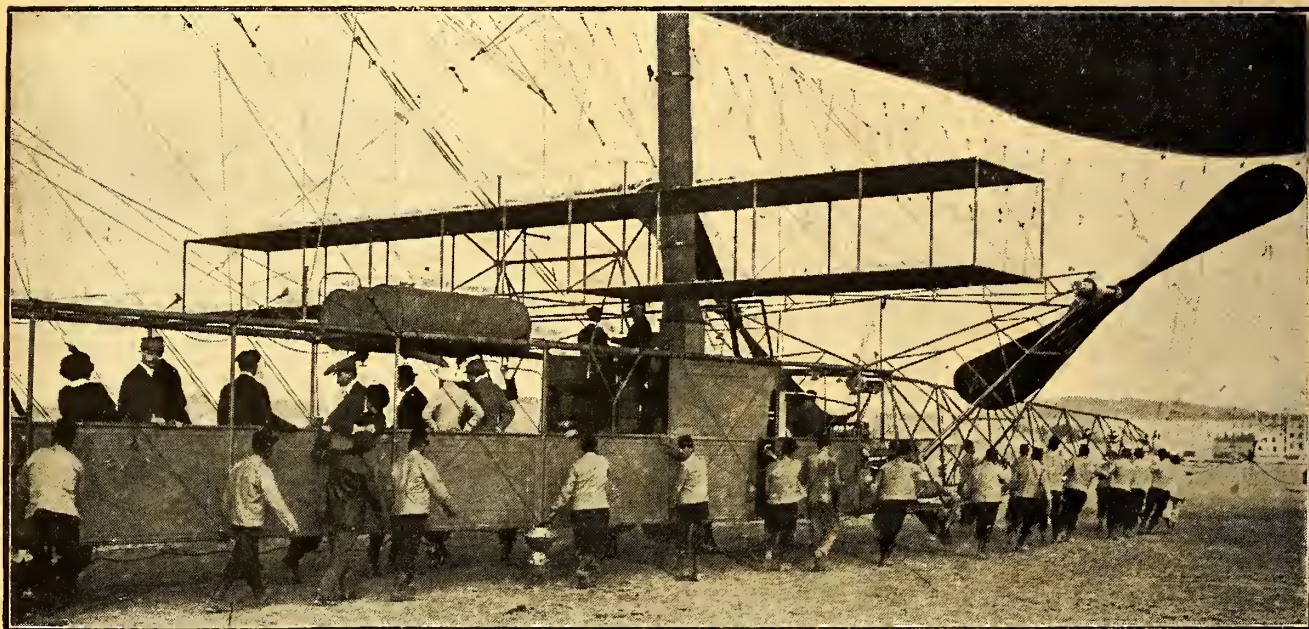
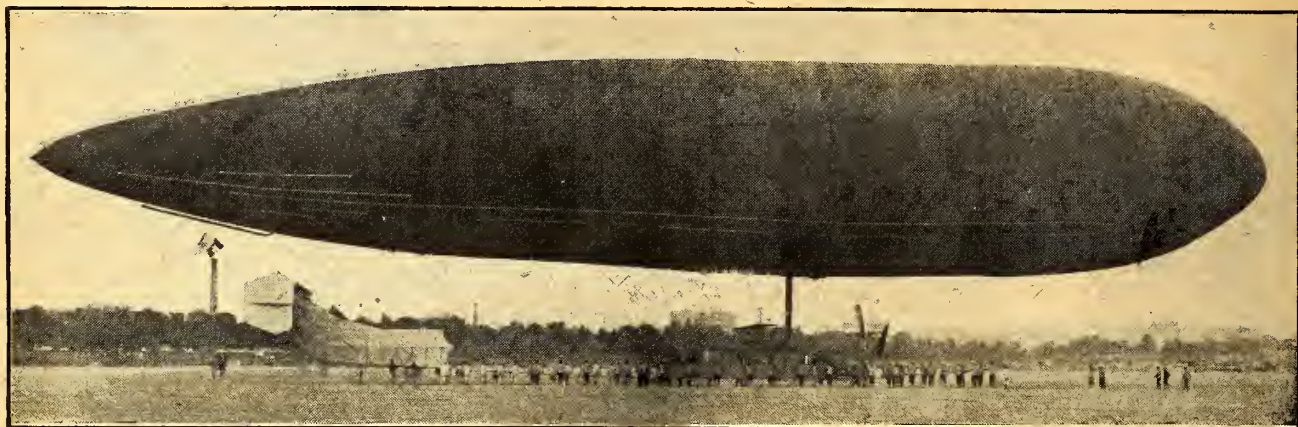
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Three views of the Clement-Bayard Airship "Dupuy de Lôme," one of the most successful French pre-war airships. The curious arrangement of control planes on the stern of the long car is worthy of note, as is the streamline shape of the envelope. This ship was built in 1912.



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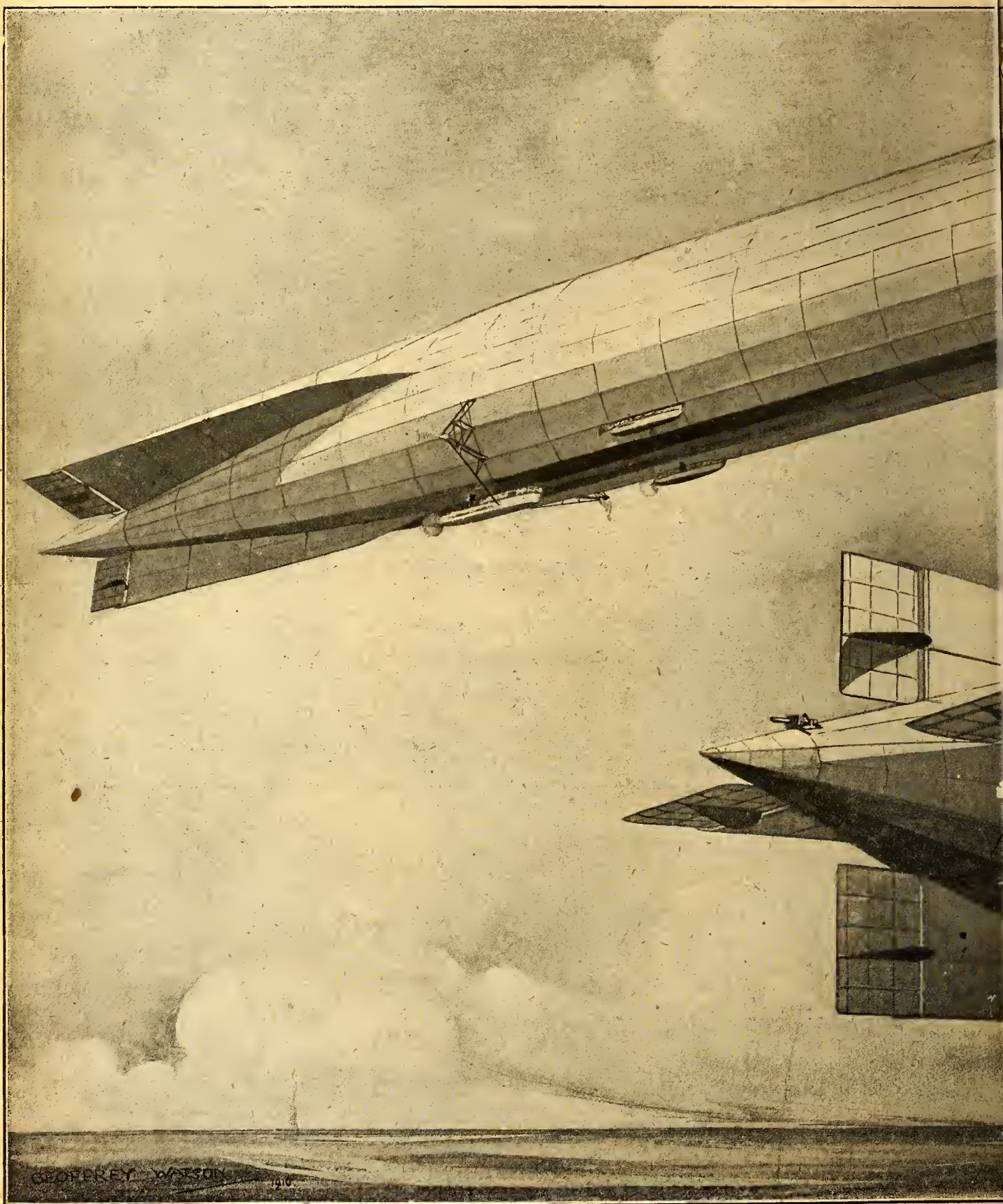
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THE MODERN



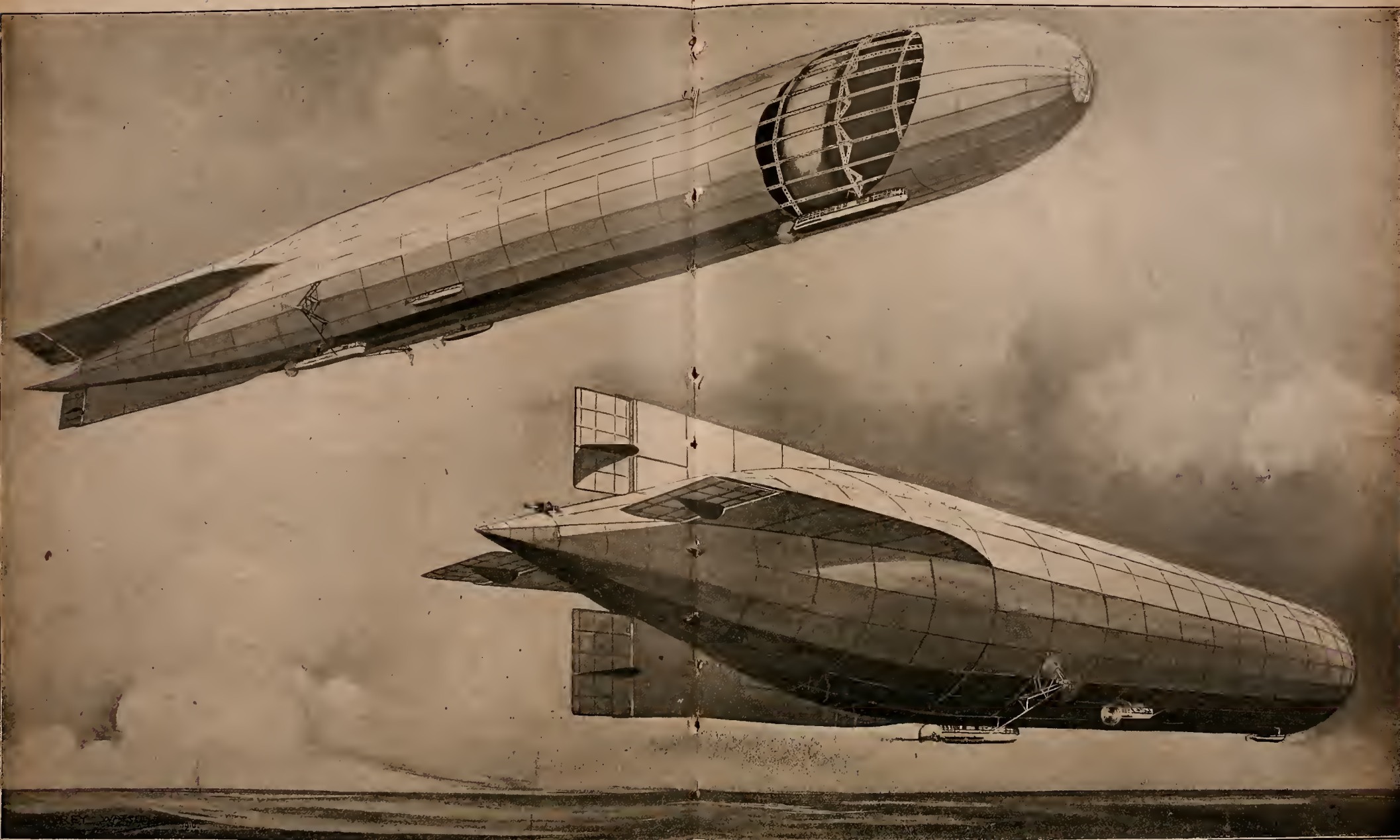
TWO VIEWS OF A MODERN ZEPPELIN: Sketched after inspection of a ship recently brought down, the gas bags, a portion of the outer covering being eliminated for that purpose. The gun position on the ex- have geared-down "pusher" air-screws at the stern. The ship has 1,440 horse-power aboard,

N ZEPPELIN



n England. The upper drawing shows part of the girder construction inside and the position of one of the engine gondolas. The tail fin and the tail fin car at the rear of the tail is noticeable. The after car alone contains the drive for side propellers, and all four cars are suspended from the hull. The airship is about 650 feet long by 70 feet maximum diameter. Her displacement is about 40 tons.

THE MODERN ZEPPELIN



TWO VIEWS OF A MODERN ZEPPELIN: Sketched after inspection of a ship recently brought down in England. The upper drawing shows part of the girder construction inside and the position of one of the gas bags, a portion of the outer covering being eliminated for that purpose. The gun position on the extremity of the tail is noticeable. The after car alone contains the drive for side propellers, and all four cars have geared-down "pusher" air-screws at the stern. The ship has 1,440 horse-power aboard, and is about 650 feet long by 70 feet maximum diameter. Her displacement is about 40 tons.



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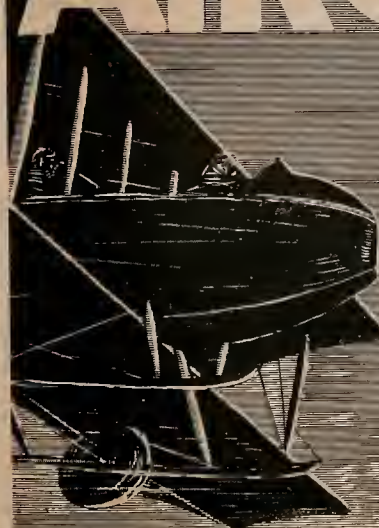


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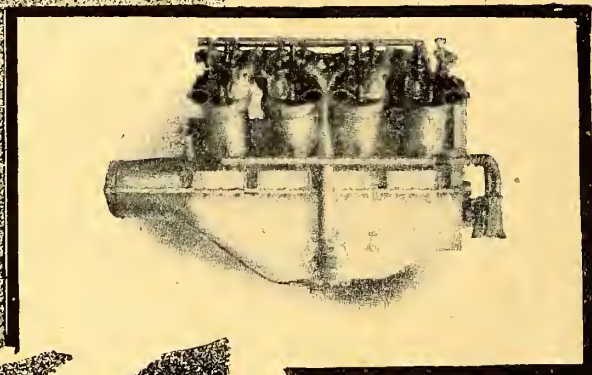
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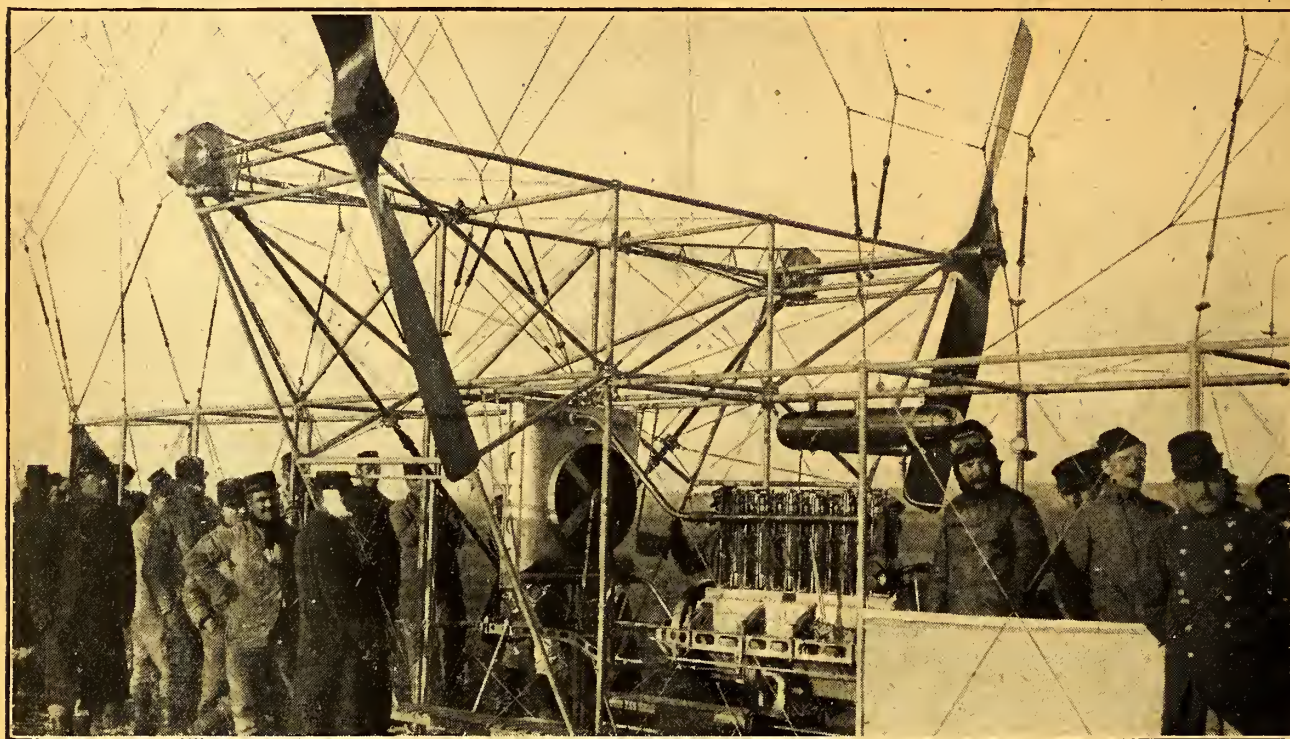
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The Power-Plant of the "Capitaine Ferber," a Clément-Bayard ship of 1911.

The Zodiac Company also produced several airships in 1909, most of them of small size intended for pleasure purposes, ranging from 2,500 cubic feet upwards. The smallest of these airships only cost £1,000 complete, and with a 16 h.p. engine travelled 13 m.p.h. In a way they might be considered as free balloons fitted with auxiliary motors. That is to say, they could be used on a breezy day and navigated obliquely to the prevailing winds and give the occupants a reasonable chance of reaching a pre-arranged landing ground. Of course, in really calm weather they could be used to travel in any direction.

In 1909 a Belgian engineer named Goldschmidt, aided by Louis Godard of Paris, constructed a small airship of 106,000 cubic feet. It was driven by two 60 h.p. Vivinus motors, which turned air screws which had metal frames covered with fabric.

GERMANY'S NON-RIGIDS.

Although the German aeronautical engineers were naturally most concerned with rigid airships of the Zeppelin type, the possibilities of non-rigid ships were not neglected.

Major von Gross, Commander of the Balloon Battalion at Tegel, near Berlin, and Major von Parseval of the Bavarian Army, who was also Director of the Society for the Study of Motor Airships, were the most persistent experimenters.

Commencing in 1907, a number of Gross airships were built for the German Aeronautical Battalion and did a good deal of useful work. No. 1 was a small ship of 63,000 cubic feet with a 20 h.p. engine. It only carried two persons and was very slow, but it provided some useful data for later types. These airships, like the Lebaudy type, had rigid spars underneath, but their hulls were better adapted for speed and lifting capacity.

The second Gross airship, known as Gross No. I and built in

1908, contained 176,000 cubic feet and attained a speed of 27 m.p.h. with two 75 h.p. Daimler motors. On September 11th, 1908, she carried four passengers during a 13 hour trip from Berlin and back, covering 176 miles and attaining an altitude of 4,000 feet. This was one of the best voyages done at that time.

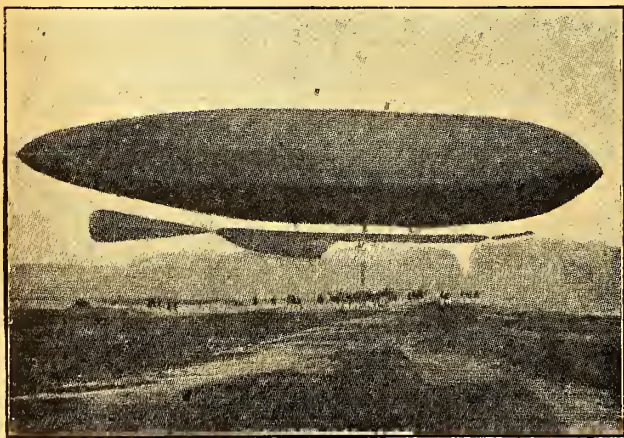
Gross No. II, built in April, 1909, was of the same size as her predecessors, but she had several improvements, including superior internal air ballonets and a successful wireless installation. This airship made a voyage from Tegel to Apolda and back in 16 hours, having covered a distance of 470 kilometres.

Gross No. III was a larger airship altogether and was propelled by four Körting motors totalling 300 h.p., and she attained a speed previously unknown in non-rigid airships, though the exact speed was kept dark. It was about 45 m.p.h.

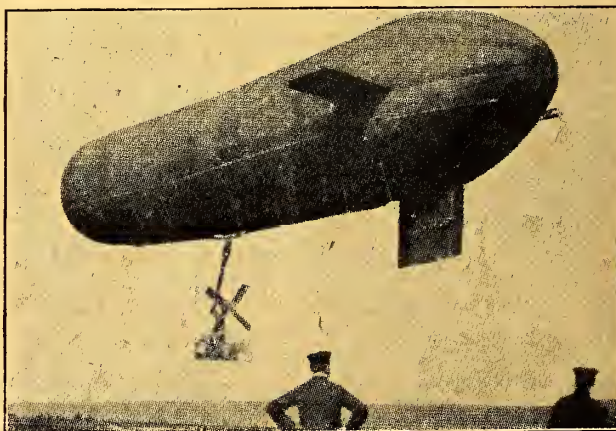
The first Parseval airship, a rather crude structure, was produced in 1906. One of the features of this airship was the arrangement of the suspension cables which allowed the hull of the ship to be canted in relation to the car to enable it to climb quickly while the car still remained on a level keel and exerted a horizontal thrust.

The second Parseval was of greater bulk and power than her predecessor, being 190 feet long and 35½ feet in diameter and of 113,000 cubic feet capacity. The same system of suspension was retained, as also was the cylindrical shape of the envelope, and despite the unscientific shape of the gas container this ship was sufficiently successful to encourage her makers to build an even larger edition for passenger carrying.

This ship had two 120 h.p. engines which drove a pair of 13 feet fabric-covered screws. Many voyages were successfully



An early Gross Airship.

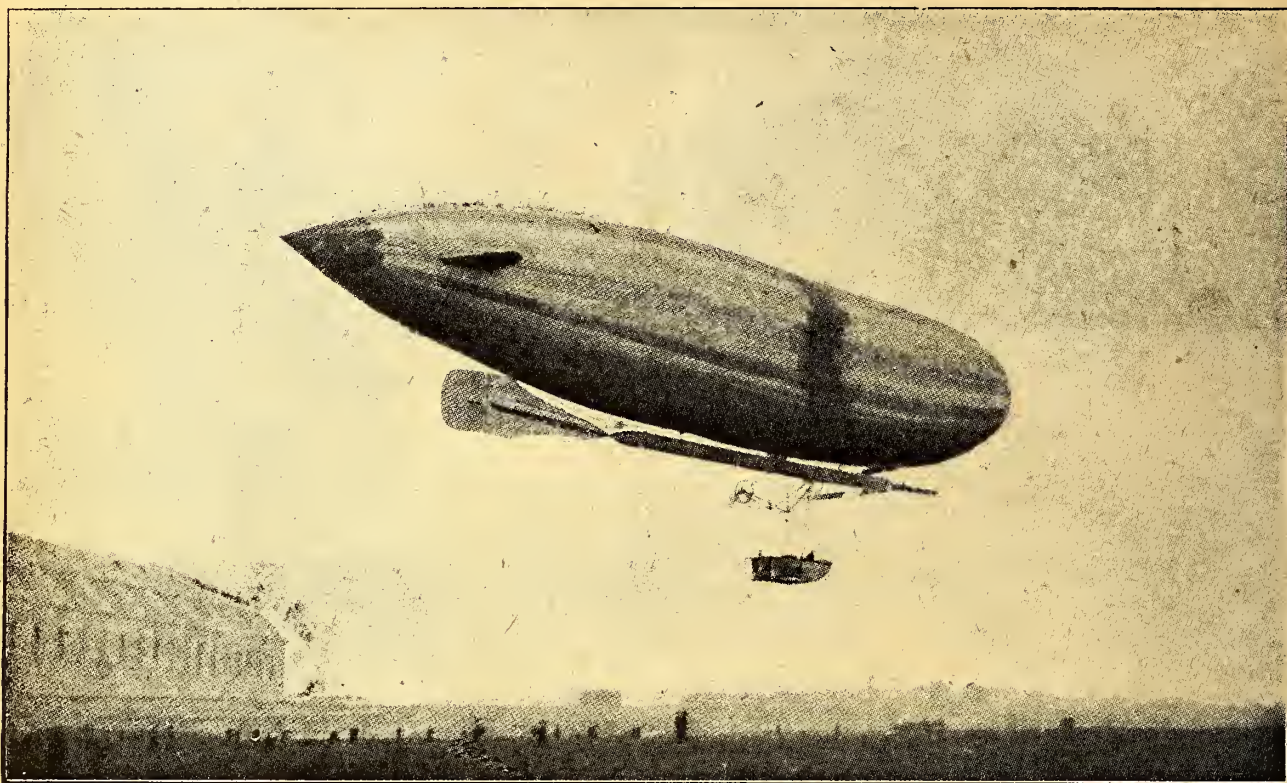


The First Parseval Airship, with a sausage envelope.

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A Gross Ship of approximately 1909-10 type. (Later known as the "M" or "Militärische" type.)

accomplished with a dozen passengers, and she afterwards attended as an auxiliary at military manœuvres. Later Parsevals were, however, built of true streamline form and attained speeds up to 50 miles an hour.

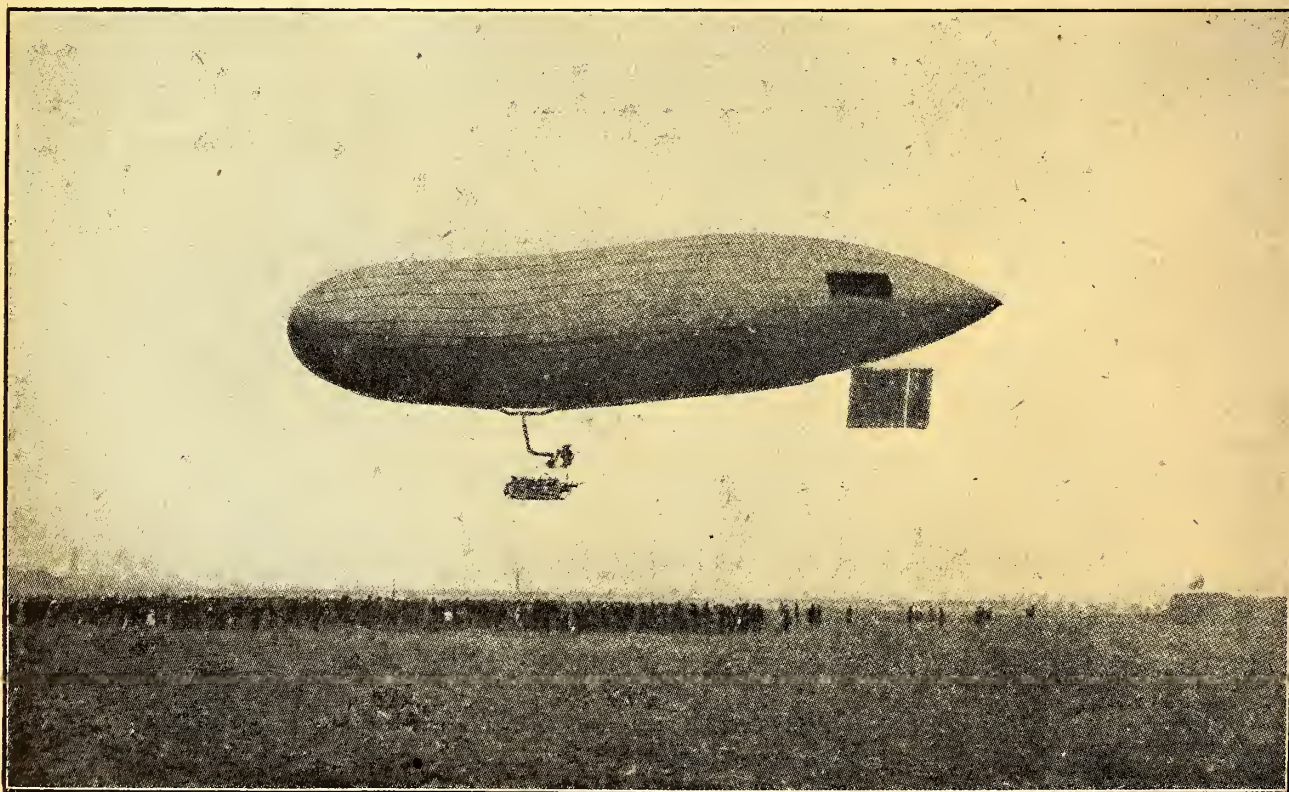
ITALY'S EFFORTS.

Naturally the Italians were not going to allow themselves to be left entirely out of the world's airship programme, and they set to work to acquire something of an airship fleet.

Their first effort, known as "P.i.," was built in 1908. "P" stands for "Piccolo," or small size. Generally speaking, she

had the lay-out of a Parseval, but a distinctive feature for a non-rigid was the use of seven compartments in the main gas-bag, the idea being to avoid a catastrophe in the event of the envelope being badly punctured. This ship was about 200 feet long, and 40 feet in diameter. She had a motor of 100 h.p., and an accredited speed of 35 m.p.h. She was controlled by vertical and horizontal rudders at the stern, and also had an internal air ballonet of large size.

The Italians acquired a 350 h.p. Parseval in 1912, and during this year developed a new type of non-rigid known as the "M."



An Early Parseval Ship, showing the beginnings of the streamline envelope.

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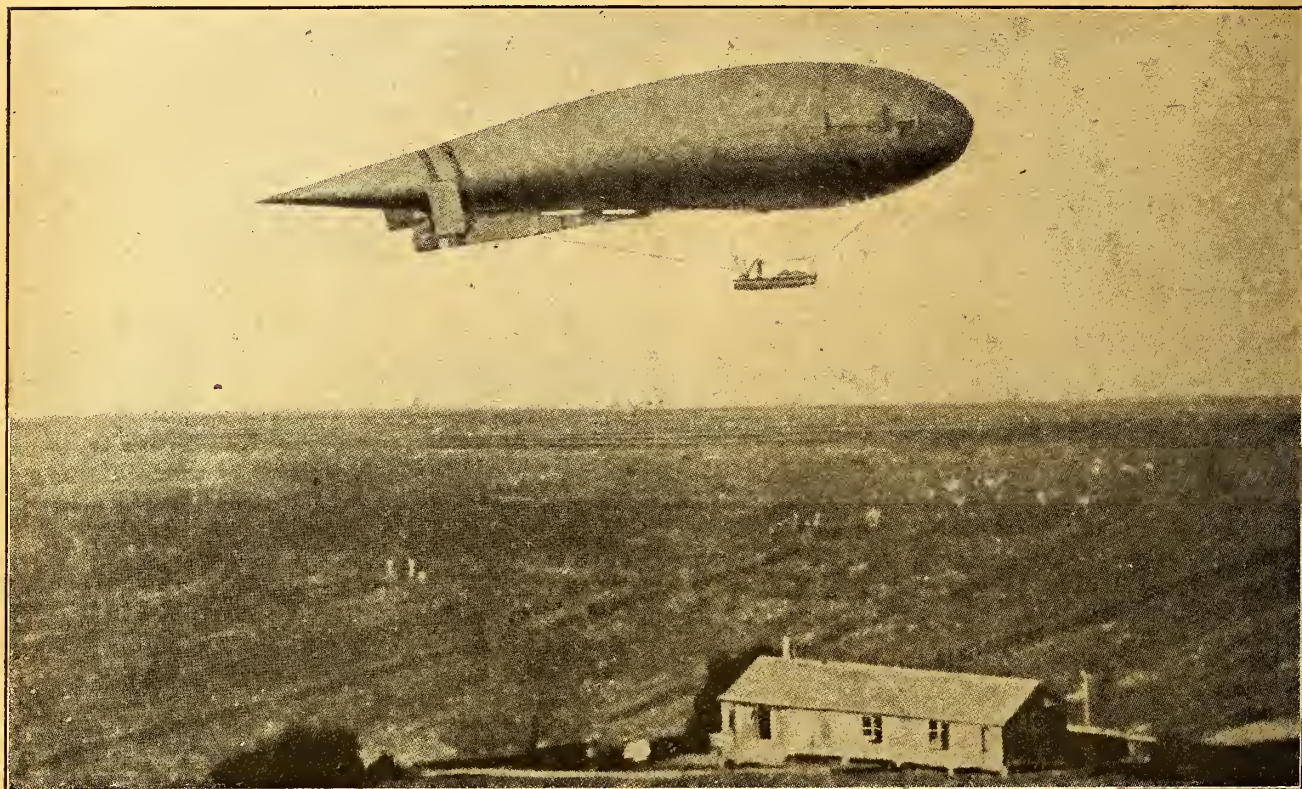
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"P.I.," the first Italian ship of the small or "Piccolo" class.

The lettering signifies Medium-size ship. She was not unlike the original Parseval, but refinements in suspension were incorporated. This vessel had engines of 500 h.p., which gave her a speed of 48 m.p.h. She was 250 feet long, and about 55 feet in diameter, and was thus one of the biggest non-rigid airships in the world.

Another type of airship developed in Italy is the Forlanini, a quite successful semi-rigid. These airships are of blunt streamline form, with a long curved nacelle built close up underneath the bottom of the envelope, the front of the nacelle taking the form of a navigating cabin.

A typical vessel of this class was the "Citta di Ferrara." She had a capacity of 424,000 cubic feet, a length of 233 feet, and a diameter of 59 feet. She was driven by three 85-100-h.p. Isotta Fraschini motors, and attained a speed of 45 m.p.h.

The Italian airships have done a good deal of useful work during the war, especially when Italy first started military operations, as comparatively little opposition was experienced at first from the Austrians, and some quite enterprising bomb-dropping was done. They have also done very well at sea, as scouts and mine-sweepers.

RIGID AIRSHIPS.

As regards the German endeavours with rigid airships, these were developed mainly through the energy and inspiration of Count Ferdinand von Zeppelin. He commenced his experiments in 1900, the general principles embraced in the present ships

being found in the first edition, which was of 400,000 cubic feet, and weighed nine tons.

This first airship was propelled by two 16-h.p. motors and carried five men, so that it was a fairly modest outfit despite its large size.

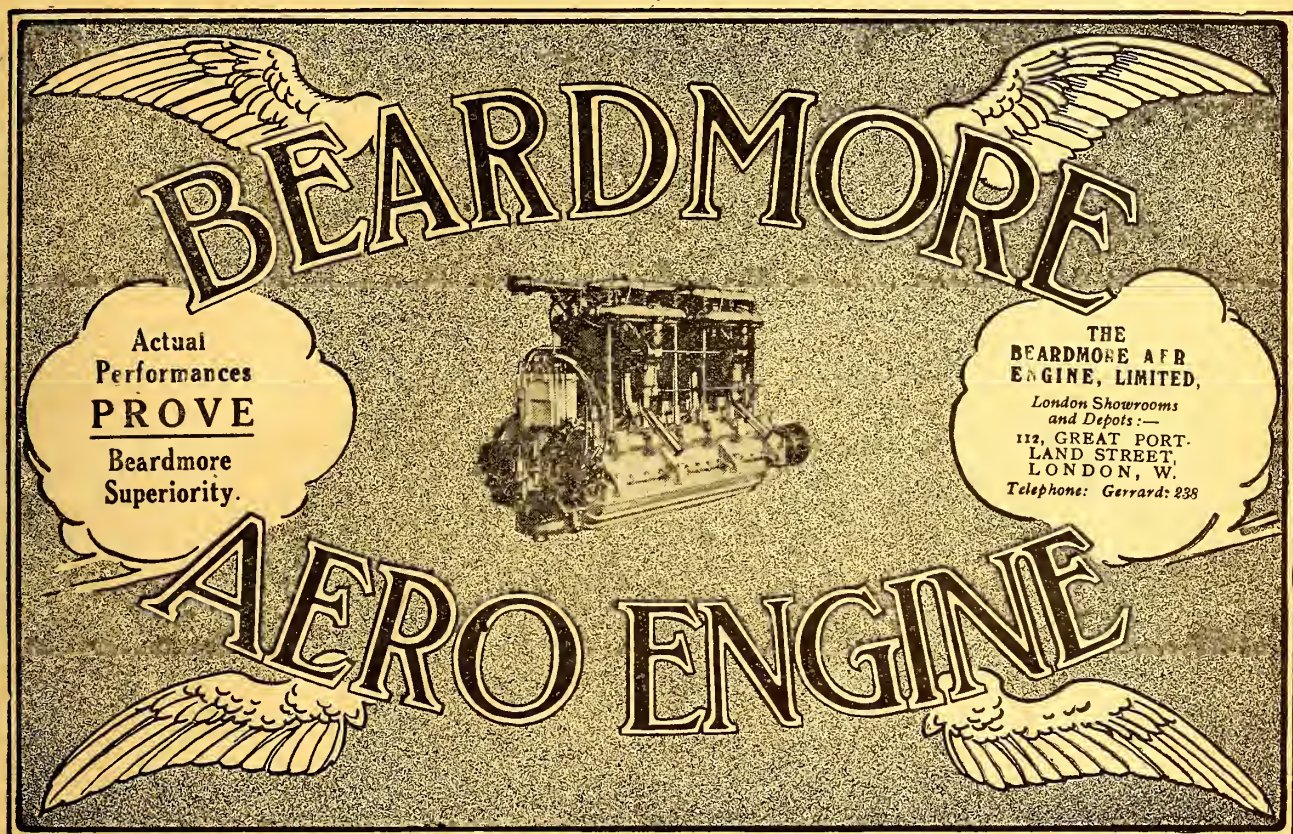
Nevertheless, it reached an altitude of 1,000 feet during a voyage lasting 1½ hours, and its success encouraged the Count to set to work to whip round for more funds to carry on his experiments. No further flying was done until November, 1906, when Zeppelin No. 2 was tested. This ship was considerably more powerful than her predecessor, having two 85-h.p. Daimler motors, but she was wrecked very early in her trials.

This did not discourage the Count, and he courageously continued his experiments year after year, and losing ship after ship. Some of them were handed over to the German Government, and most of them came to grief either as Government property or during their tests. Up to the outbreak of war nearly thirty of these airships had been constructed, and certainly not more than a dozen had survived, but the gradual improvements incorporated in the successive editions, not only in the matter of power and size, but relating to matters of control and general usefulness, formed the foundation of the still more advanced airships which have been used during the war.

The chief difficulty the constructors had to face was the problem of manœuvring the airships on the ground during choppy winds, and several ships were almost completely wrecked through



Three Italian airships, the "M.3" (medium size), the "P.5," and the "V," or velocity type.



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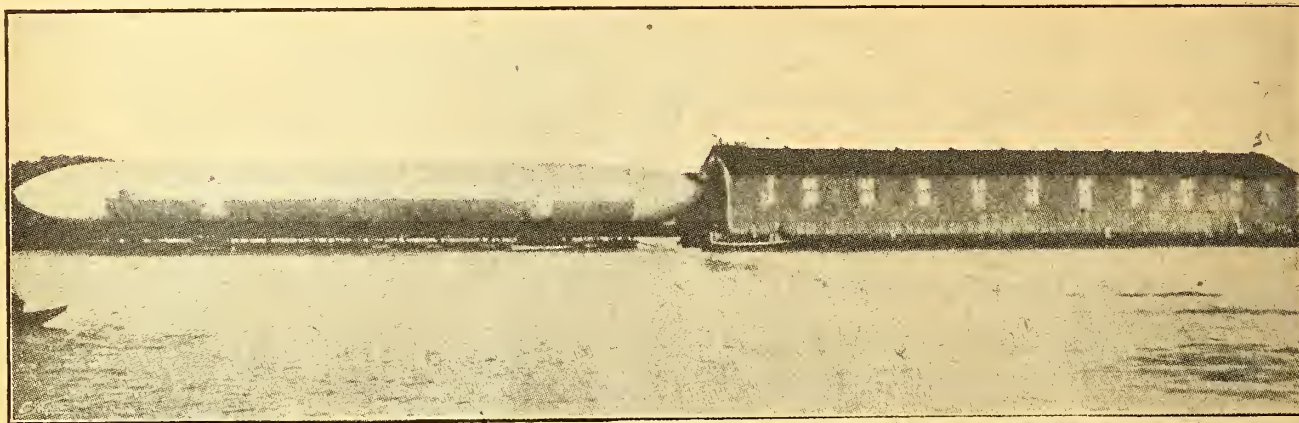


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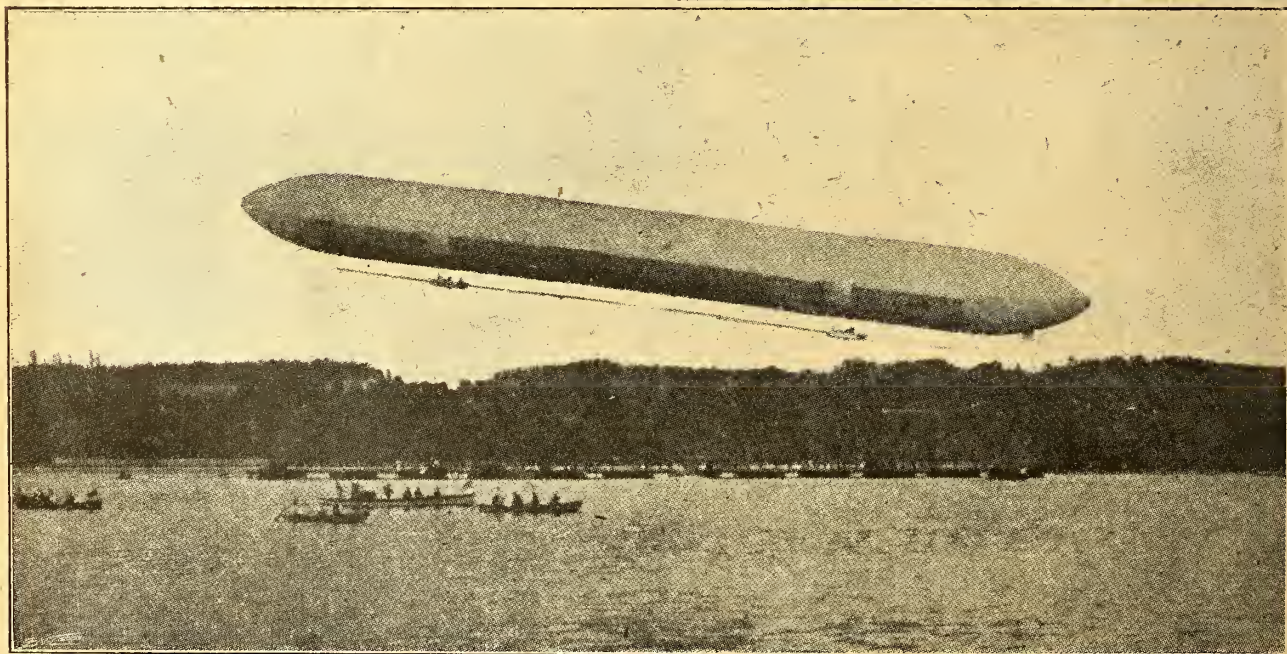
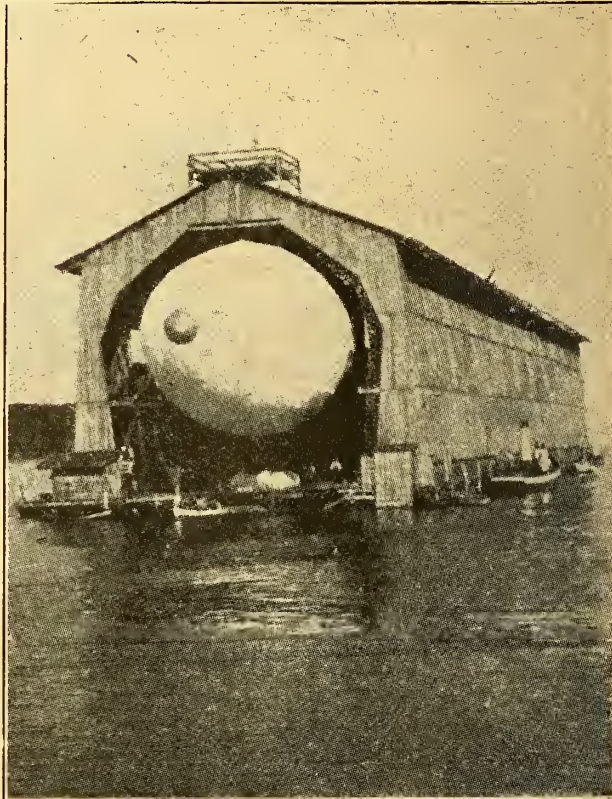
being broken against the walls of their sheds, and on more than one occasion fire destroyed ships altogether.

The extraordinary point, however, was the immunity of the actual crews of the airships from death, until the thirteenth year of the Zeppelins' existence, despite the ever recurring accidents and the frequent loss of life and serious injury among the landing parties and the workshop hands. Not a single fatality occurred to any of the navigators until September, 1913, when Naval Zeppelin L.I, which was actually the fourteenth Zeppelin to be constructed, was wrecked in the North Sea by a squall, her crew of thirteen being drowned. Less than a month later Naval Zeppelin L.II, the eighteenth Zeppelin to be built, exploded in mid-air in Johannisthal, and her crew of twenty-five were killed.

Since that date the losses through mishaps in navigation, through the bombardment of airship sheds and attacks by hostile anti-aircraft guns and aviators have been extremely heavy. The Germans still seem to think it worth while to continue the use of Zeppelins as offensive weapons, and apparently justify themselves in this action because the expectation of airship raids naturally entails the employment of a large force of anti-aircraft experts on the part of all the Allies, and thus absorbs military resources which might be otherwise employed in the offensive conduct of the war from the Allies' point of view. In addition to this, the Zeppelin has been so long held up as a fetish in the German Empire that the discontinuance of airship raids would create a considerable fall in the prestige of the Administration both among the population in Germany and in neutral countries.

THE WOODEN SCHÜTTE-LANZ.

The success of the Zeppelins naturally aroused a desire on the part of German aeronautical enthusiasts to attempt the construction of rigid airships embodying new principles, and in 1912 extensive experiments were made by the Schütte-Lanz firm at Mannheim to produce a rigid airship made of wood braced with wire, and a big airship of this type soon materialised. Unlike



Three Views of the First Zeppelin.—Above she is shown coming out of her floating shed on a raft of pontoons. Below she is rising from Lake Constance. The curious jacket on top to which the wiring was attached, is worth noting.

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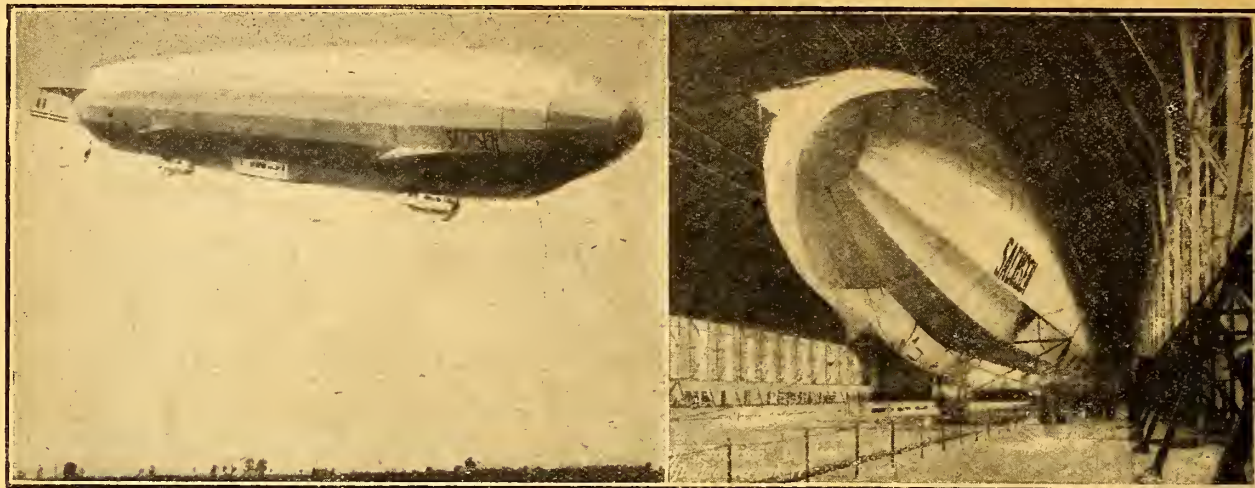
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The Zeppelin "Sachsen" of 1913, a very successful passenger-carrying ship.

the Zeppelins of that period, it was of cigar pattern, but of approximately the same size. It had two gondolas, containing an engine driving a screw at the stern. The framework of the hull was made up of a series of spiral ribs, cross-braced in an elaborate fashion both by wood girders and steel wire, and wire was wound right round the hull from one end to the other, and used liberally in other directions. This ship worked out considerably heavier than did the Zeppelin of the period, and it was only a qualified success; but the second edition, which, at the outbreak of war, was in commission as Naval Airship L.4, gave quite good results. S.L.2 had three hanging gondolas containing engines and pusher-screws, and a little navigating cabin forward built into the underside of the hull. This vessel was even bigger than the Zeppelins at that time, and after doing a good deal of scouting work she was wrecked on the Danish Islands in the autumn of 1914.

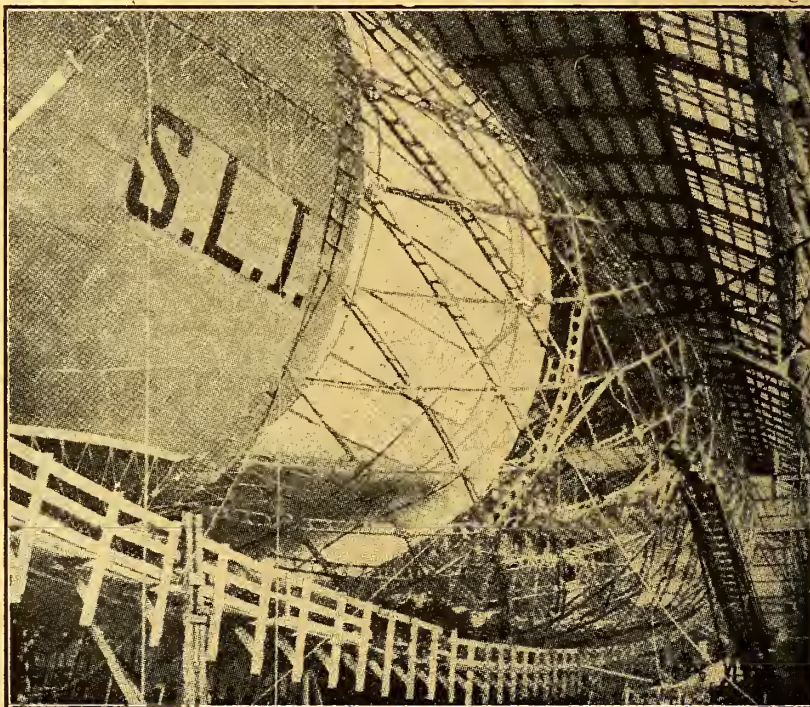
Other airships were the Spiess, built in France, and the Naval "Mayfly," built in England. Neither of these was successful.

BRITISH AIRSHIPS.

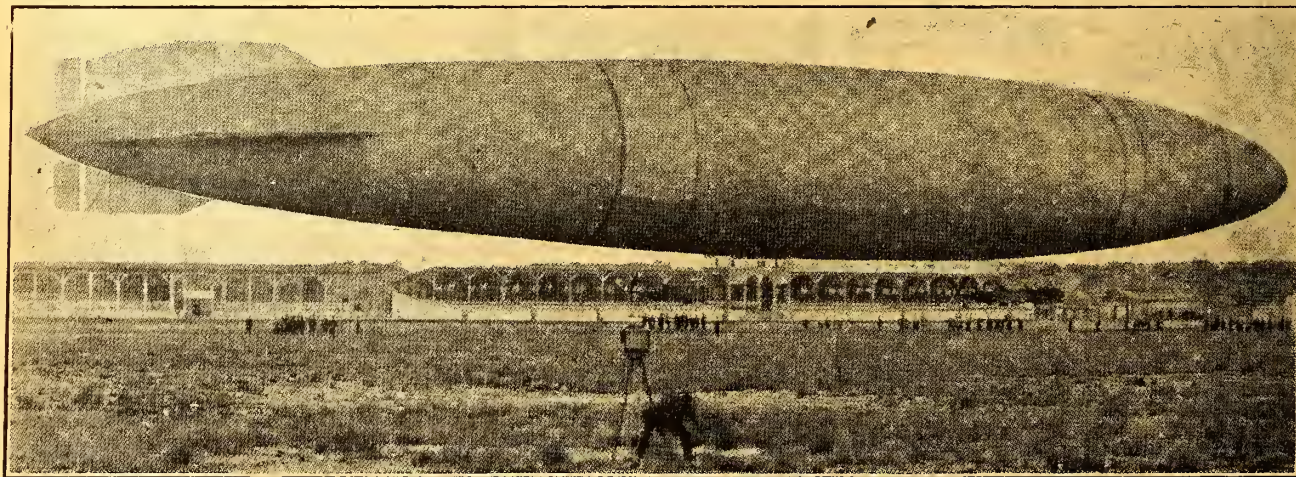
The science of aerostation in England was confined almost entirely to balloon work until the beginning of the twentieth century.

Private enterprise did not attain a sufficiently high level to undertake the expensive work of experimenting with airships, and official apathy went no further. The earliest experimenters to do anything at all were Dr. Barton, Mr. Spencer, and Mr. E. T. Willows. Dr. Barton built an airship at the Alexandra Palace somewhere round about 1900, with which he made a partially controlled voyage over London.

Mr. E. T. Willows, of Cardiff, experimented as far back as 1904, and produced the first really successful British airship. Between this date and 1910 he made some local flights on very small airships built by himself. His first airship, which was



Some structural details of the Schütte-Lanz. The wooden girders seem familiar.



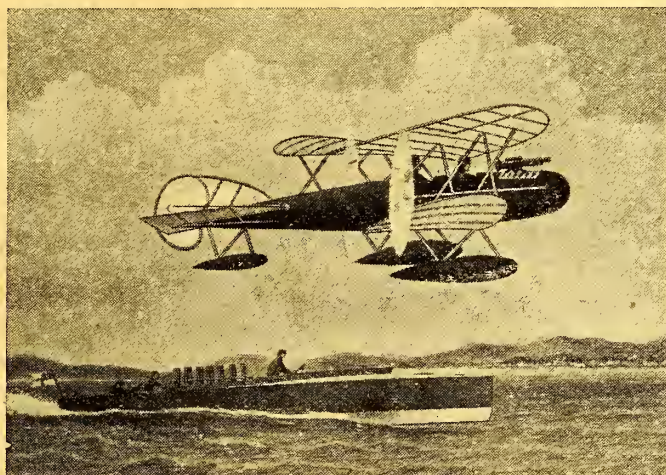
Schütte-Lanz I, the first German rigid wooden ship.

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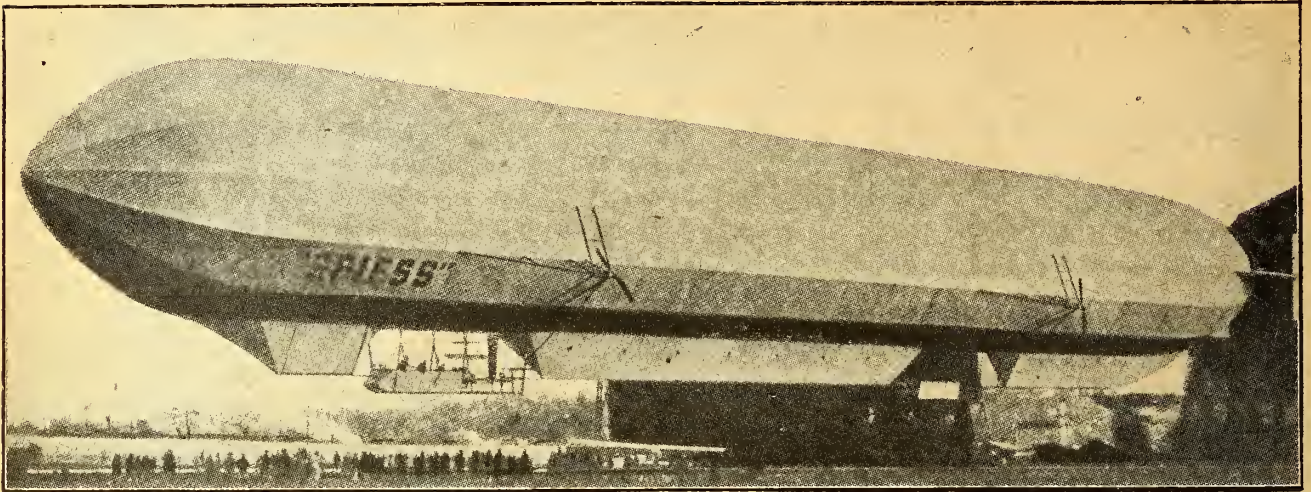
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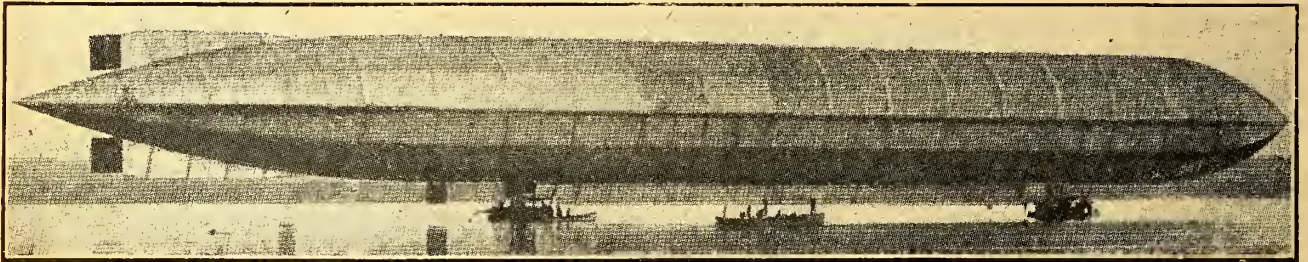
The Spiess Rigid Airship. A French machine which was not a success.

constructed during 1904-5, was semi-rigid, with an envelope of heavy Japanese silk, 74 feet long, and 18 feet in diameter. The nacelle was triangular in section, and built of light tubular steel. It had a length of 45 feet. It was driven by a 7-h.p. twin Peugeot motor, which turned a 10-feet two-bladed propeller at the stern, and a pair of propellers in front, which were used to control the airship by varying their angle of attack. These propellers formed the subject of a patent, which was afterwards appropriated by the Government.

Within the limitations of its low power this airship performed quite well, and working on data gained from these experiments Mr. Willows built two more nacelles which were both bought

taking a little under ten hours to cover the distance of 140 miles. His system of navigation was simple, but efficacious. He steered as accurately as possible by compass, and every few miles came down quite close to the earth and inquired his whereabouts by megaphone. The airship was stabled in the grounds of the Crystal Palace.

In November, 1910, with a new envelope and accommodation for a passenger, Mr. Willows started from Wormwood Scrubbs to fly to Paris, accompanied by Mr. Goodden, who is now a test pilot of aeroplanes at the Royal Aircraft Factory. The French coast was reached without incident, the ship being at a height of 5,500 feet. As the start had been made in the afternoon, it



The "Mayfly." The first British attempt at a rigid ship.

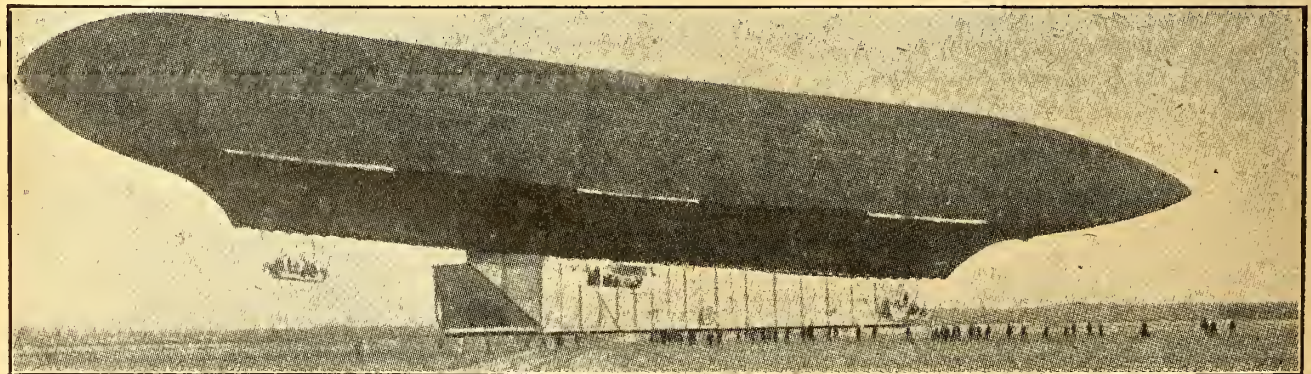
by the Government Balloon Factory at Farnborough, in February, 1908.

Late in 1909 he produced a small semi-rigid single seater airship with twin propellers and with an ingenious belt drive. This airship had a fixed fin near the stern, and a cruciform rudder for horizontal and vertical control. The swivelling propeller idea was also employed, and the engine used was a 30-h.p. J.A.P. The envelope was 86 feet long by 22 feet maximum diameter, and contained 20,000 cubic feet of gas. It contained an air ballonet, and from the envelope was hung a 56-feet boom built up of bamboo and steel, which took the place of the long nacelle in the earlier airship.

Finally he reached such a point of success that he was able to fly from Cardiff to London on the J.A.P.-engined airship,

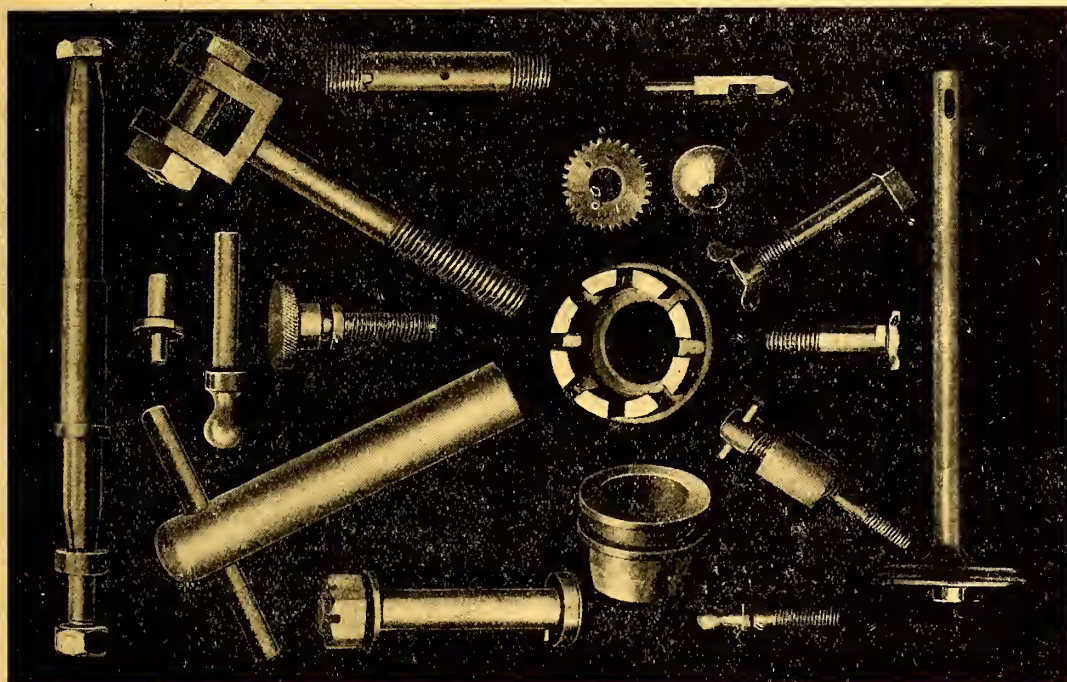
was past midnight, but they landed safely at 2.0 a.m. near Douai. The airship was damaged after landing, and was dismantled and taken to the Clément-Bayard works at La Motte-Breuil, and it was not until after a number of attempts that the airship finally reached Paris.

In the meantime the Government Balloon Factory at Farnborough had made a few experiments with airships. Their first effort was turned out in 1907, under the joint direction of Colonel (now General) Capper, R.E., and the late Mr. S. F. Cody. It was a curious structure of the semi-rigid type, its envelope being exactly the shape of a sausage, and, like a sausage, being covered with skin, of the variety usually known as gold-beater's skin, of about fifteen thicknesses. Naturally this envelope was about as expensive as it could well be. The envelope



The Siemens-Schuckert of 1908-1911, a German semi-rigid which was not successful.

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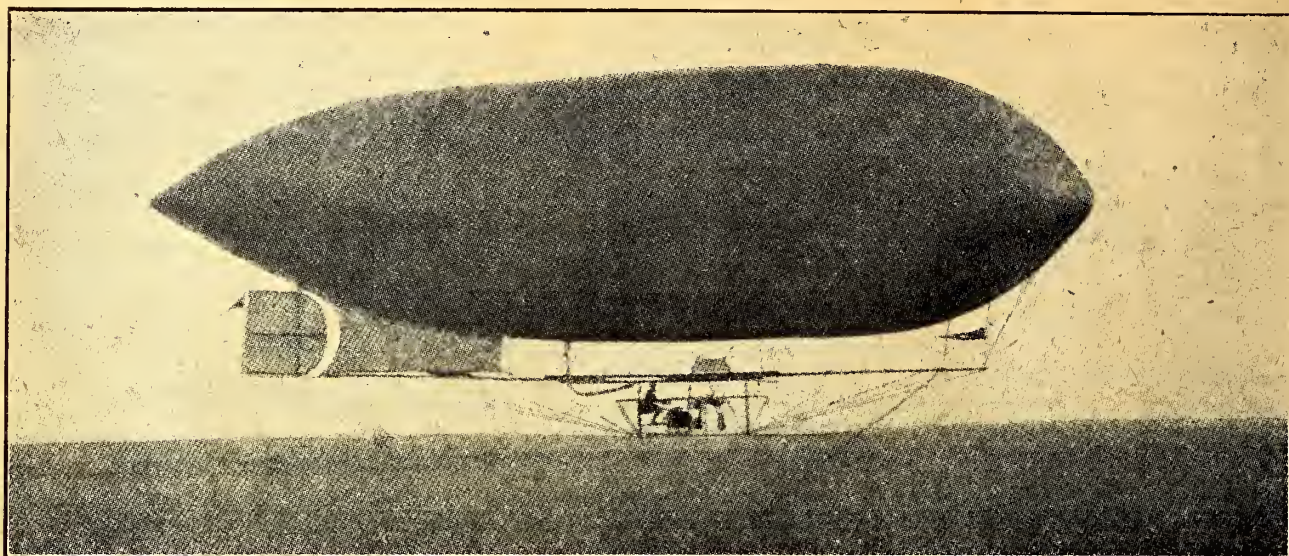
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The Willows 1909 Type. A variant of this was the first airship to cross the Channel.

of this first airship was 25 feet in diameter, and of proportionate length, but, unfortunately, the goldbeater's skin was extremely absorbent, and the airship was caught in a slight rain squall and wrecked. This unfortunate airship bore the grandiloquent title of "Nulli Secundus."

Unperturbed by the unfortunate end of this airship the Balloon Factory set to work to build a bigger one on exactly the same lines, with proportionately magnified defects, and apparently not being endowed with even a rudimentary sense of humour they christened this edition the "Nulli Secundus II," whereupon a contemporary issue of "Punch" suggested that the earlier airship should have been christened "Nulli Primus," and its successor, should there be one, "Nulli Tertius."

The bigger airship had a large envelope of 42 feet diameter, and a 100-h.p. engine, which was expected to give it a speed of 40 miles per hour.

In "Nulli Secundus" (Primus) the long nacelle supporting the control members was hung from the envelope, attached to four broad bands which passed right over the top of the gas-bag, and from this nacelle a small car depended, containing the crew, the engine, and the two propellers.

In "Nulli Secundus" (II) the nacelle was enclosed in fabric attached more closely to the bottom of the envelope, the four suspension bands still being employed. Various alterations were made in the control members, but the car still hung from beneath its nacelle. The car itself supported an inverted pyramid of steel, which took the place of a landing chassis, the idea being that the whole airship could pivot about the base of the pyramid when on the ground.

In October, 1907, this airship made a trial trip from Farnborough to London and thence to the Crystal Palace, where it was anchored to ride out a slight breeze that had sprung up. The wind became stronger, and the airship was wrenched out of the hands of the people who were endeavouring to hold it down, and very successfully wrecked.

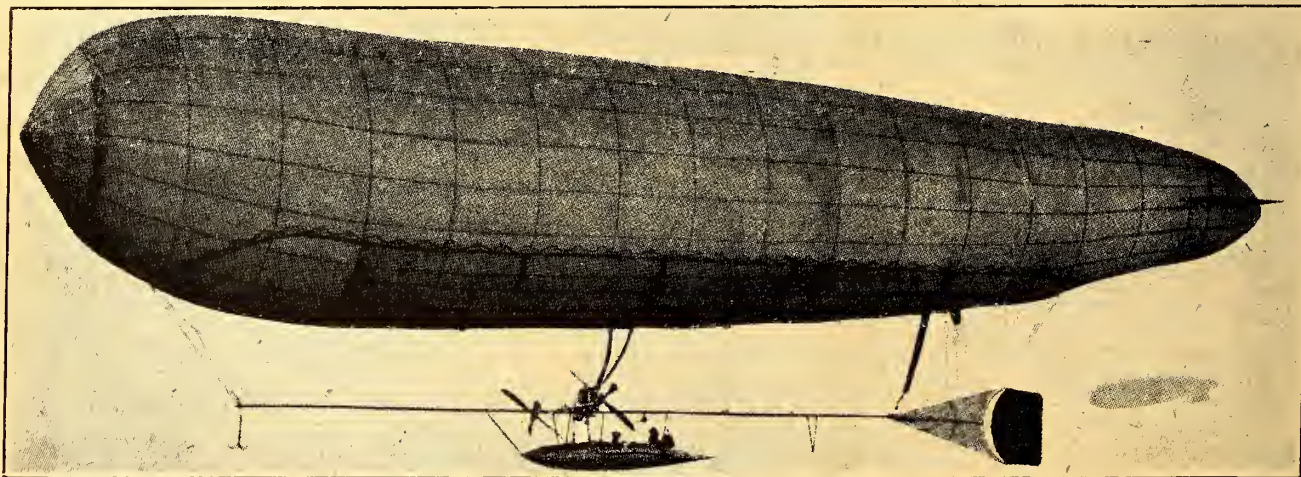
In the early part of 1909 the Balloon Factory turned out a small airship known as the "Baby," with two 12-h.p. motors. The envelope of this airship was fish-shaped, with three inflated fins at the tail in place of the usual flat control members. A long car was suspended from the envelope, containing the crew and the engines, and at the stern end of this was mounted a rudder and elevator. This airship was known as "Dirigible II," and was reasonably successful considering her limitations. She was duly inspected by the King. Later on the inflated fins gave way to fins of more conventional type.

This airship was followed by a larger vessel, brought out in the spring of 1910. It was on general lines resembling a Clément-Bayard airship. It had a long streamlined envelope with small external ballonets at the tail, and a nacelle suspended underneath. The length of the envelope was 154 feet. The car was 84 feet long, and was composed of steel and hickory. It contained an 80-h.p. Green engine driving two pairs of two-bladed propellers, and had accommodation for the crew. Mr. Willows' patent for using swivelling propellers to control the elevator of an airship was incorporated.

Owing to the yellow "dope" used on the fabric this airship was familiarly known as the "Yellow Peril," its official designation being No. 2a. Col. Capper and Lieut. (now Major) Waterlow, R.E., were chiefly concerned with her construction and navigation.

In June, 1910, a new airship of small size was produced, known as the "Beta." This was the first of a series of small airships to be built by the British Government, which performed in various reincarnations up to the time of the outbreak of war.

The "Beta" had a 30-h.p. Green engine, and the long nacelle of the earlier types was retained. Soon after her first appearance she was flown from Farnborough to London and back carrying Col. Capper, Lieut. Waterlow, and the late Mr. T. Ridge. The trip was made at night, and was completely successful. At the time the airship made this trip she had been



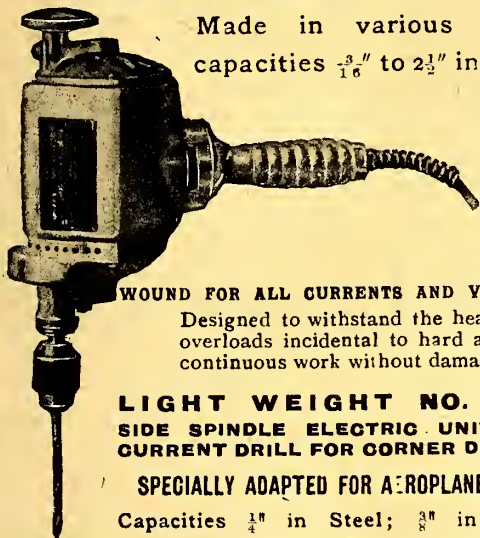
The Willows 1912 type. Later taken over by the Admiralty.

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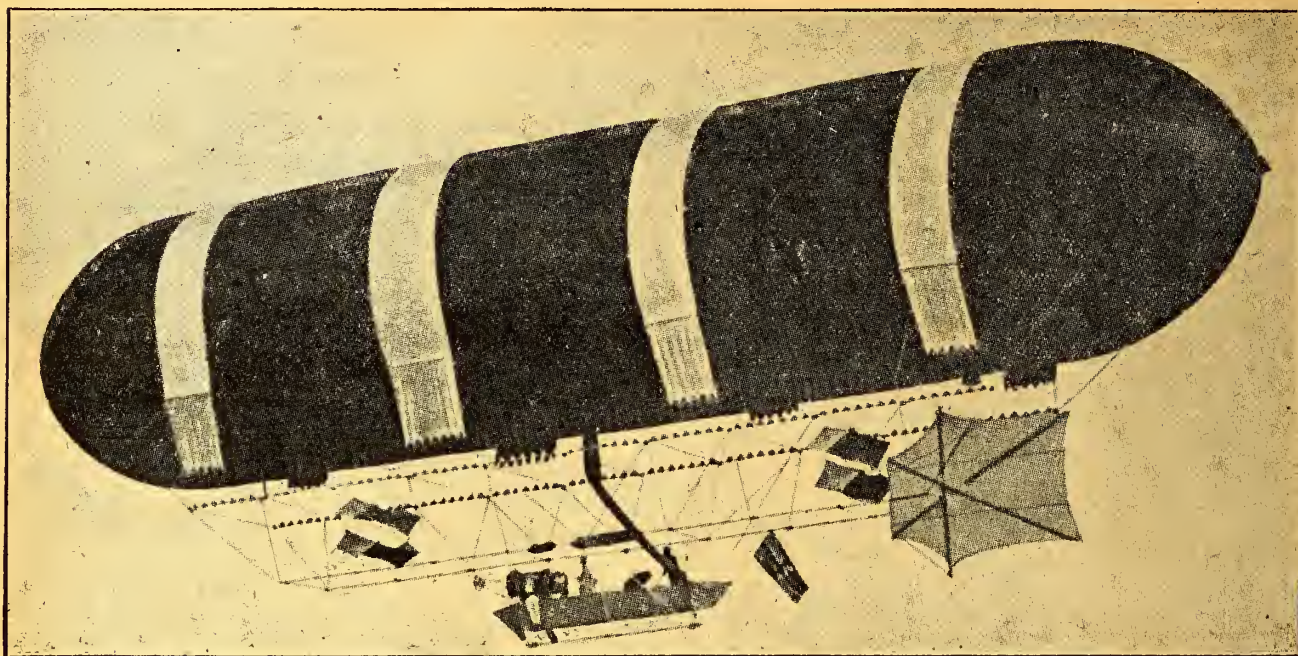
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"Nulli Secundus" I. The first Army Airship, 1907.

lengthened by 20 feet from her original model, and the stern ballonets had been replaced by fins. In the course of her career the "Beta" flew 3,000 miles with the same small engine. The 100 h.p. Green engine has done even finer work in airships of more recent type belonging to various countries. Thus the Green has more than fulfilled its early promises of reliability.

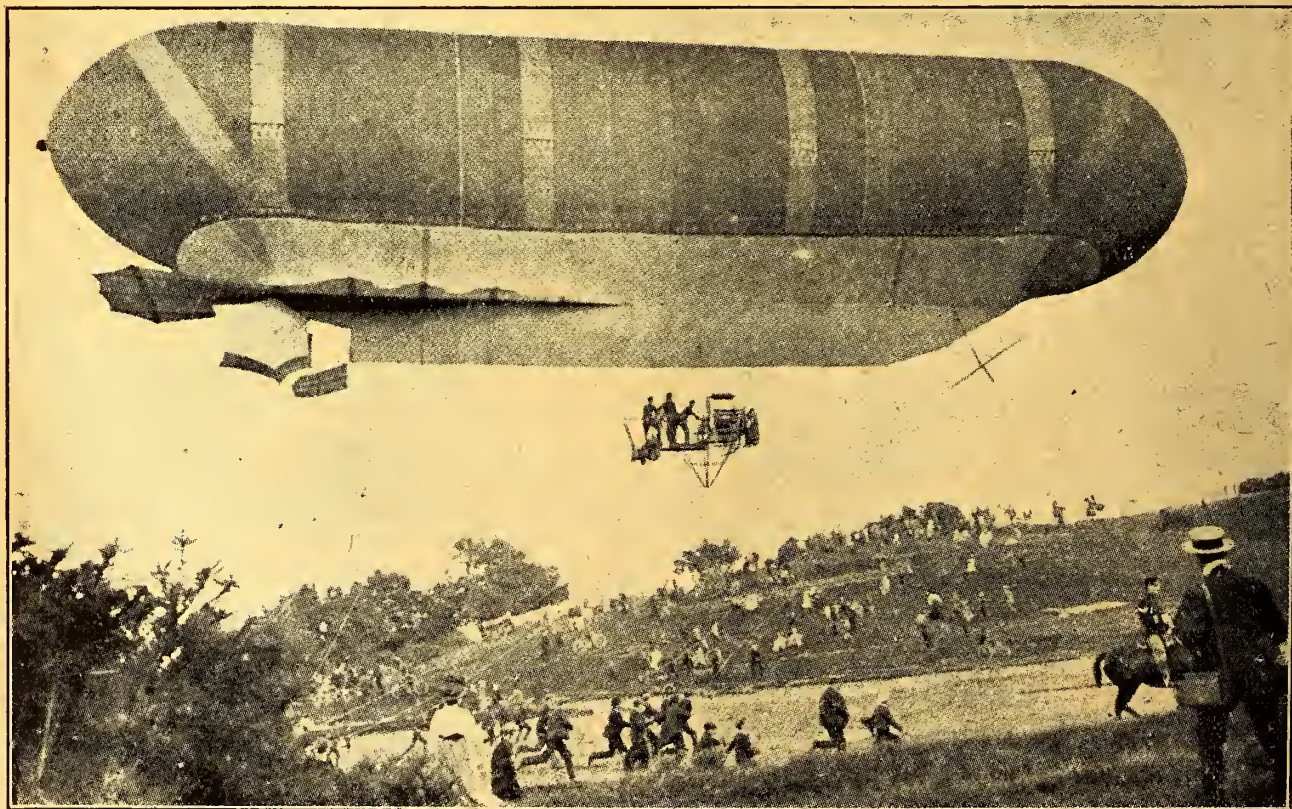
A second journey was made over London during July by the "Beta," with a safe return to Farnborough. During the experiments with the "Beta" a larger airship, christened the "Gamma," was built.

The "Beta" took part in the autumn manoeuvres in October, 1910, and the officers in charge of her obtained some useful data as to the limitations of airships as air scouts.

An addition was made to the Army airship fleet in September, 1910, by the presentation by subscription organised by the

"Morning Post," of a large Lebaudy airship. This airship was built in France and flown across the Channel. She was one of the finest examples produced up to date, and was 337 feet long. She contained three internal air ballonets, and was well equipped in every way. Her general design was similar to previous Lebaudys, with a long spar underneath the envelope, but she was, of course, much longer than any of the previous Lebaudys. The power plant was two 135-h.p. Panhard motors, driving two propellers. The propellers were inter-connected, so that both could be run by one motor if necessary.

After extensive tests at Moisson the airship was flown to England and alighted at Aldershot, the journey of 197 miles being performed in five hours 28 minutes, a speed of 36 miles an hour. Unfortunately the envelope was rather badly damaged in pushing the airship into the shed, but despite the unfortunate termina-

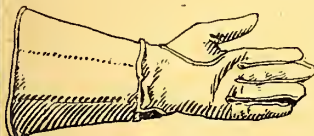


"Nulli Secundus" II, of 1907.

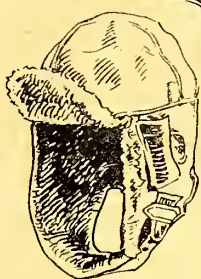
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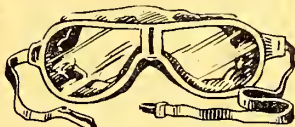
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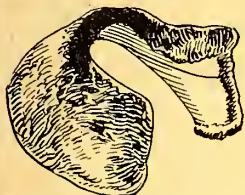
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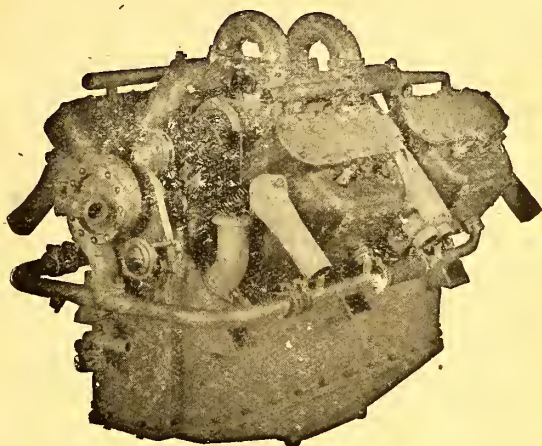


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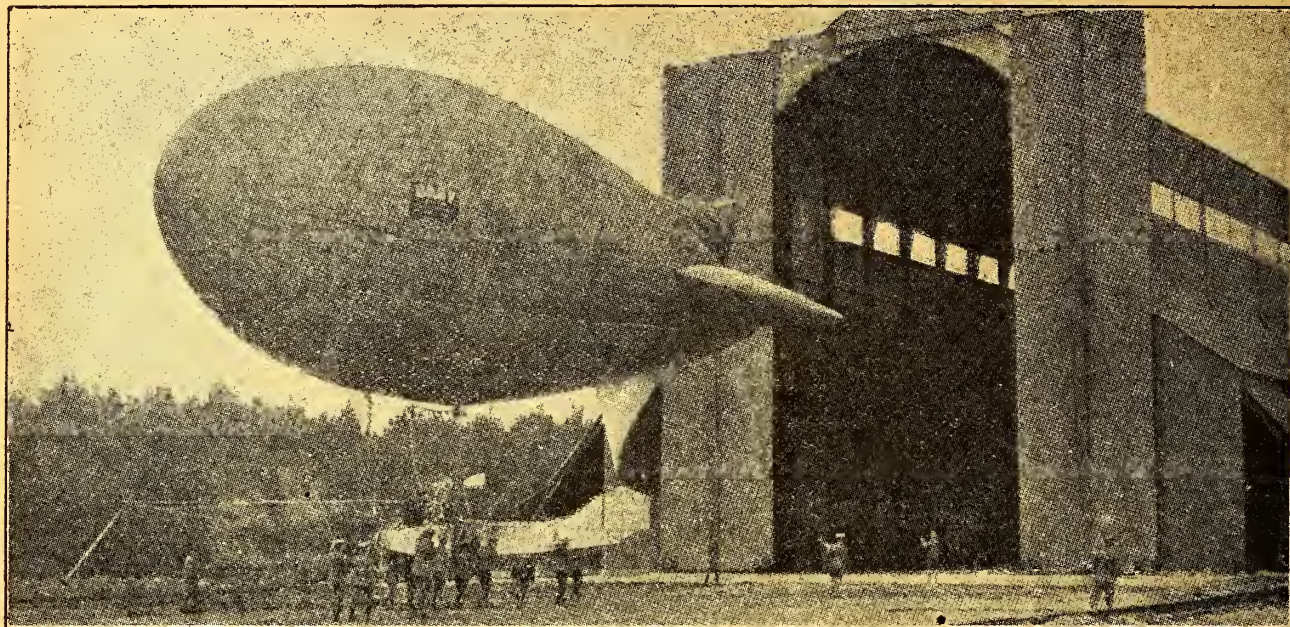
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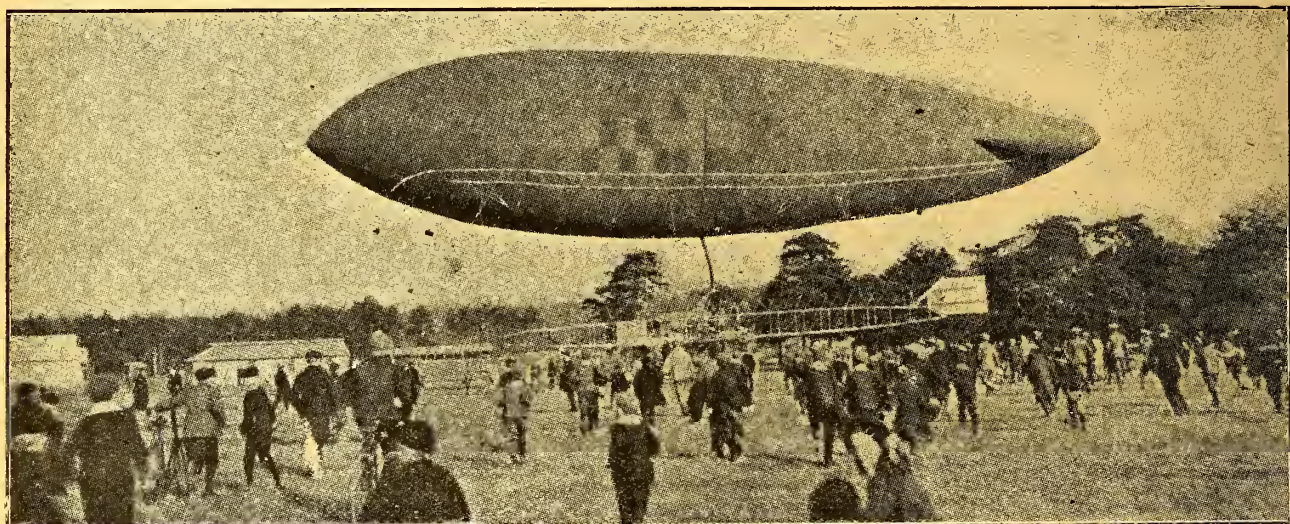
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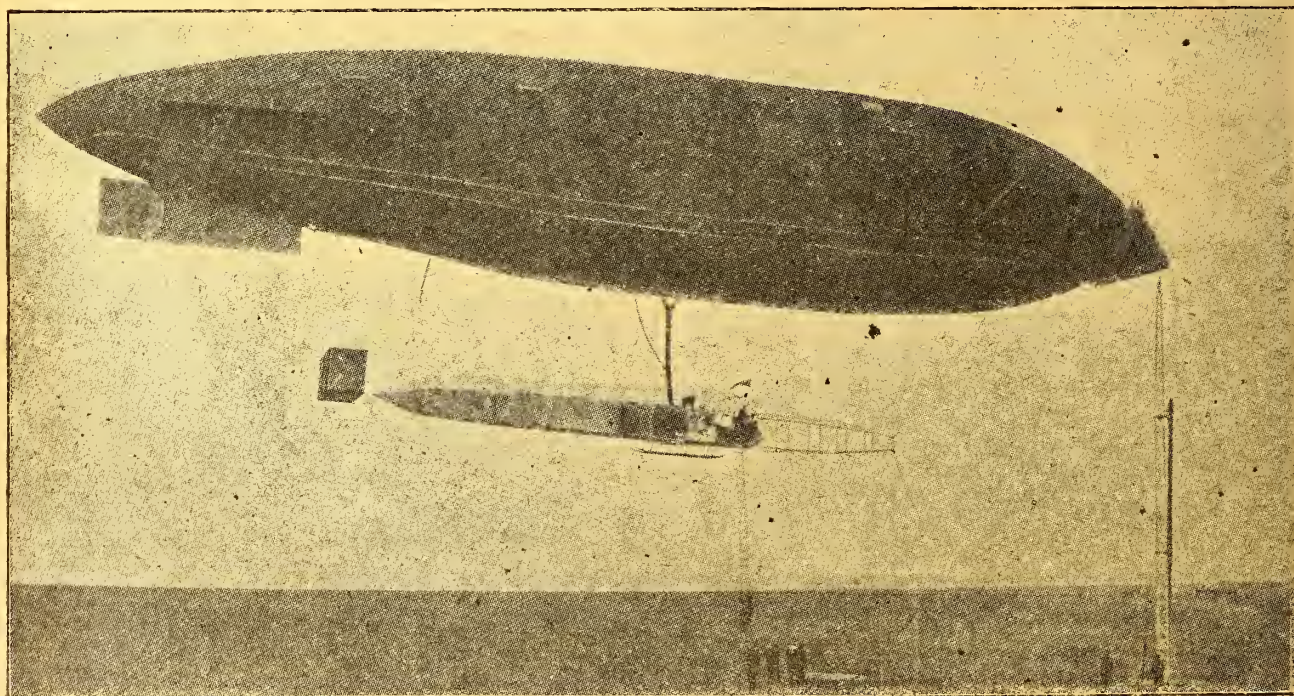




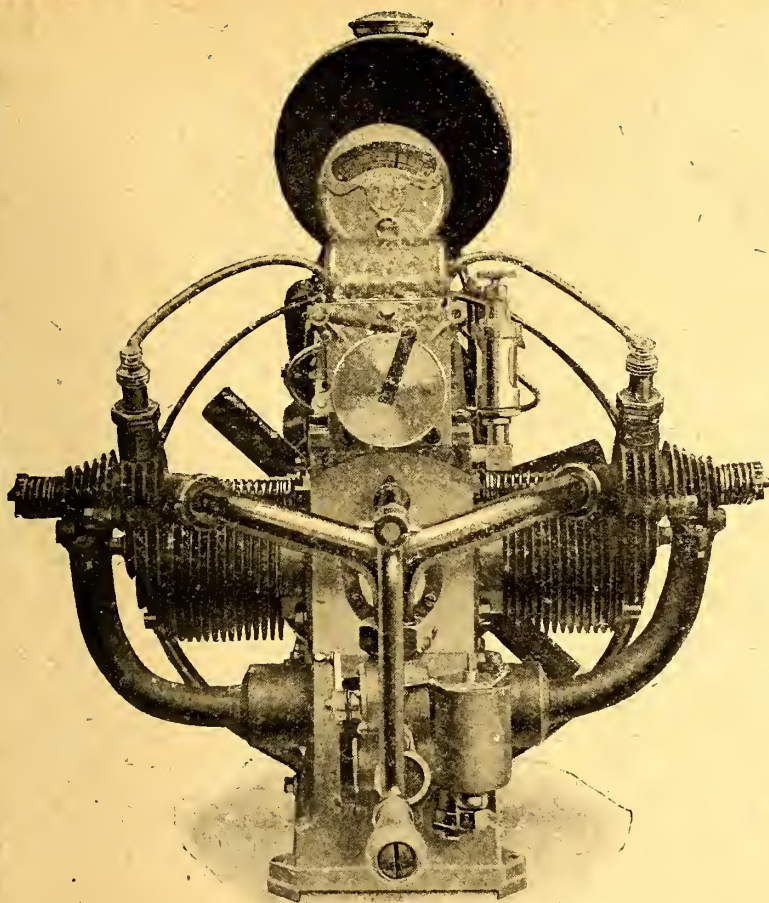
The small Army "Baby" leaving a large shed. This ship was built in 1908.



The Army ship "Beta" of 1909-12.



The Army ship "Gamma," of 1912, anchored to a mooring mast of the type originated by the Naval Airship Section.



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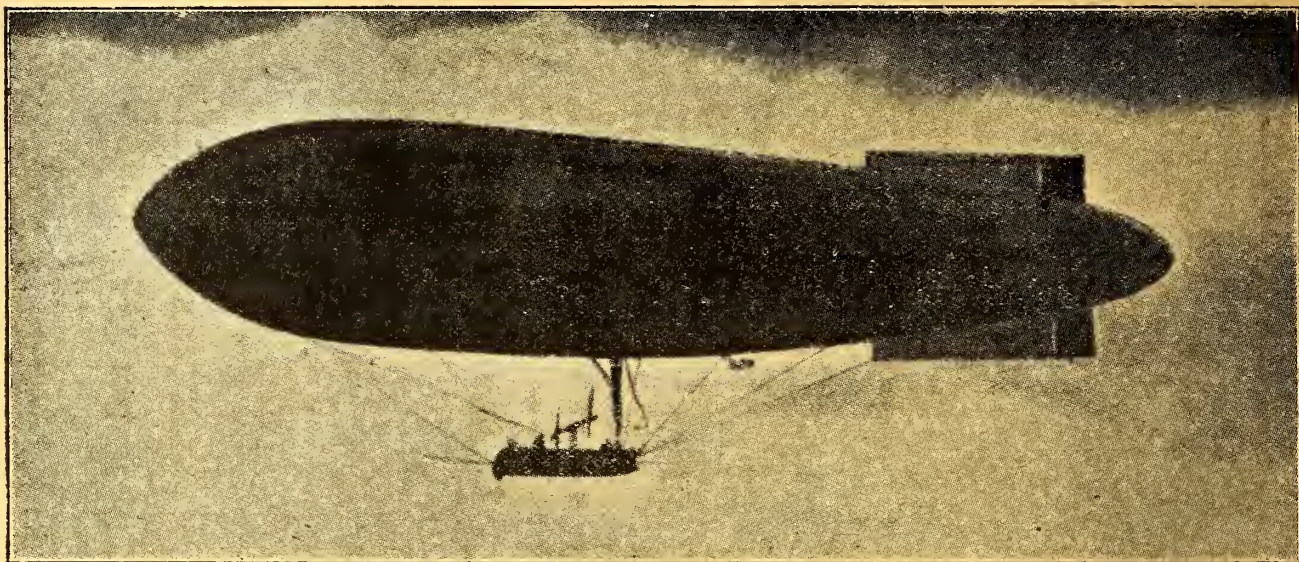
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The Army ship "Delta" of 1912-13.

tion the voyage was quite good, the ship carrying eight passengers.

Although it was announced that the damage done was slight it took several months to make it good, and it was not until May that an attempt was made to fly. One fine afternoon the airship was brought out and set forth on a flight round the neighbourhood of Farnborough, but the attempt at landing was disastrous. A party of sappers were posted at what was intended to be the landing ground and the airship was brought down near the ground but not sufficiently closely for them to reach the tow-ropes. A small circuit was made and the airship came past the landing party for a second time, but still too high. A third attempt was made, and although sufficiently low down the airship was not manoeuvred immediately over the sappers' heads, and although they sprinted they were unable to overtake her, and as the engines had been stopped the ship drifted towards rising ground in the neighbourhood. The guide rope travelled across trees and sheds and brought the airship broadside on to the wind. When it was too late the engines were started up again and they only served to drive her into some trees, and the ship was so badly damaged that she was never rebuilt.

A Clément-Bayard was also purchased by the Army, under political pressure, and with the help of some private financial deals, skilfully conducted by Mr. Harvey du Cros, M.P., but the ship was handed over to the R.A.F. after her long-delayed arrival in England, and she disappeared in the capacious maw of that official scrap-heap.

Naturally the Navy watched the operations of the Army airships with great interest, and finally came to the conclusion that the airship should not be left entirely out of the Naval programme. It was thought fitting that an attempt should be made to emulate the performances of the Zeppelins. Elaborate plans were got out and Vickers, Ltd., were chartered to build a large rigid airship at their Barrow works.

Lt. L. F. Usborne, R.N. (who was killed last year during an airship experiment, as Wing Commander), and Lt. C. P. Talbot,

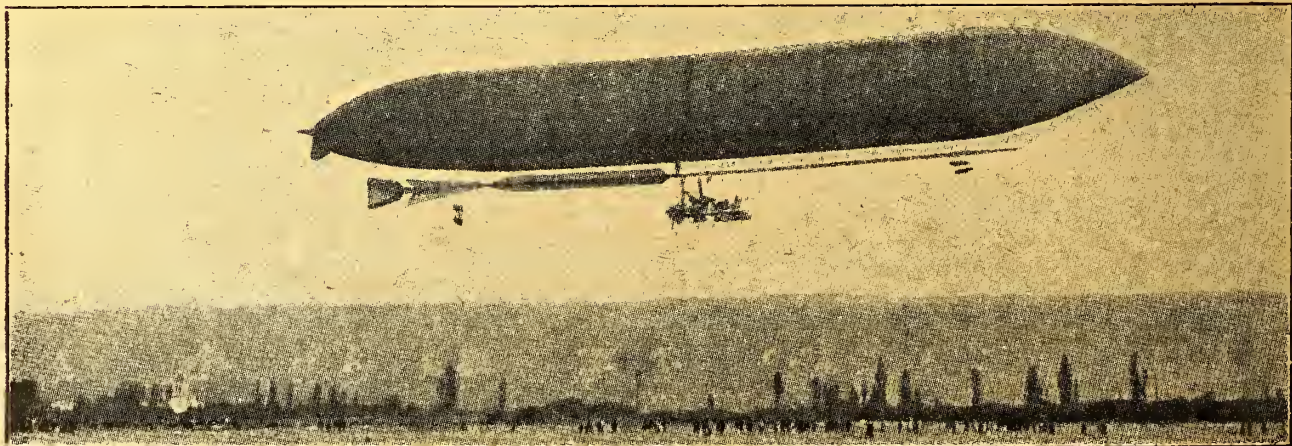
R.N., were largely concerned with its construction. Capt. (now Commodore and Superintendent of Aircraft Construction, R.N.A.S.) Murray F. Sueter and Comdr. (now Wing-Captain) E. H. Edwards were later appointed for special airship service.

Her construction occupied something like a year, and when finally completed tentative experiments were made first in the shed and afterwards in the open air to test her buoyancy. It was found that she was incapable of lifting her own weight, and extensive alterations were made to endeavour to remedy this defect. These alterations occupied a period of four months, and much discussion was raised in the Press as to whether the airship would be a success or not. The airship was unofficially christened the "Mayfly" and this name seems to have been an evil omen, implying, as it did, that she might not.

A stage was reached when free flight might be expected, but considerable trouble was found in handling the airship, and a large floating screen was constructed, behind which she might be moored.

Finally the airship was officially taken over by the Admiralty without passing flying tests, and on September 24th, 1911, she was brought out of her shed by the water side with a view to taking her for an initial trip. At this time a slight wind was blowing in a direction contrary to the line of the shed and as soon as half the envelope had emerged it tried to turn down wind. The tug which was towing the vessel from the shed endeavoured to pull her straight, but it was without avail, and the framework snapped about half way along. The crew of the airship had a very narrow escape from drowning, as they had to dive in order to get clear of the wreck. The airship was then got back somehow into the shed, from which she never emerged again.

The "Mayfly" was frankly an attempt to produce a rigid airship on Zeppelin lines, and if anything with improvements, at any rate in the opinion of her designers. In some respects the "Mayfly" bore a curious resemblance in outline to the modern war-time Zeppelin, and resembled these aircraft more strongly than her actual contemporaries. Her envelope had about 19 compart



The Lebaudy "Morning Post" Airship of 1910.

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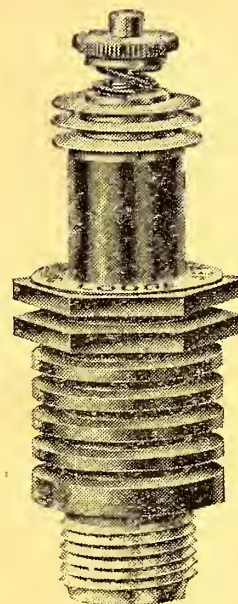
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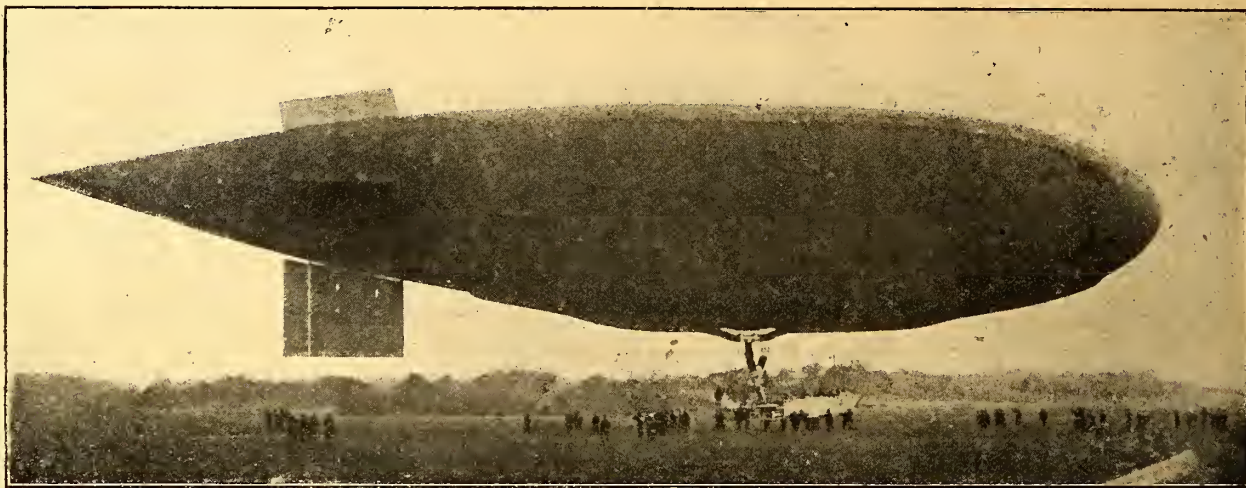
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The British Naval Parseval, 1913-14 type.

ments, was comparatively blunt in the bow and had a long tapering stern with four large fixed fins arranged in cruciform fashion, but unlike the super-Zeppelin she had triplane elevators and quadruplane rudders. Another curious resemblance was the use of a pusher airscrew in the rear gondola, an unknown feature in the earlier Zeppelins. The "Mayfly," however, had a pair of side screws connected to the engine in the front gondola similar to ordinary Zeppelin practice.

The "Mayfly" was 510 feet long and 48 feet in diameter and she was fitted with two 200 h.p. Wolseley engines. The nature of her internal construction was never revealed, but presumably it was a series of 12-sided hoops held by longitudinal girders.

In the early days of Army airships the Army Balloon Factory at Aldershot was responsible for their upkeep. On the institution of the Royal Aircraft Factory they were handed over to that establishment, but at the end of 1913 those in authority suddenly decided that airship work was a Naval duty, and that thenceforth the Army should know nothing of airships, and the Navy consequently took over the whole personnel and matériel of the airship section. The airships existing at that time were the "Beta," the "Gamma," the "Delta" and the "Eta." Of course, they were all toy airships fitted with toy engines, and carrying a toy crew so far as numbers were concerned, but they represented the result of many years of serious study under immense financial difficulties by a little group of enthusiastic Army officers who naturally would have preferred to have worked on undisturbed in the Army. The airship sheds and works at Farnborough were taken over by the Navy at the same time. Some of the Military to decide!

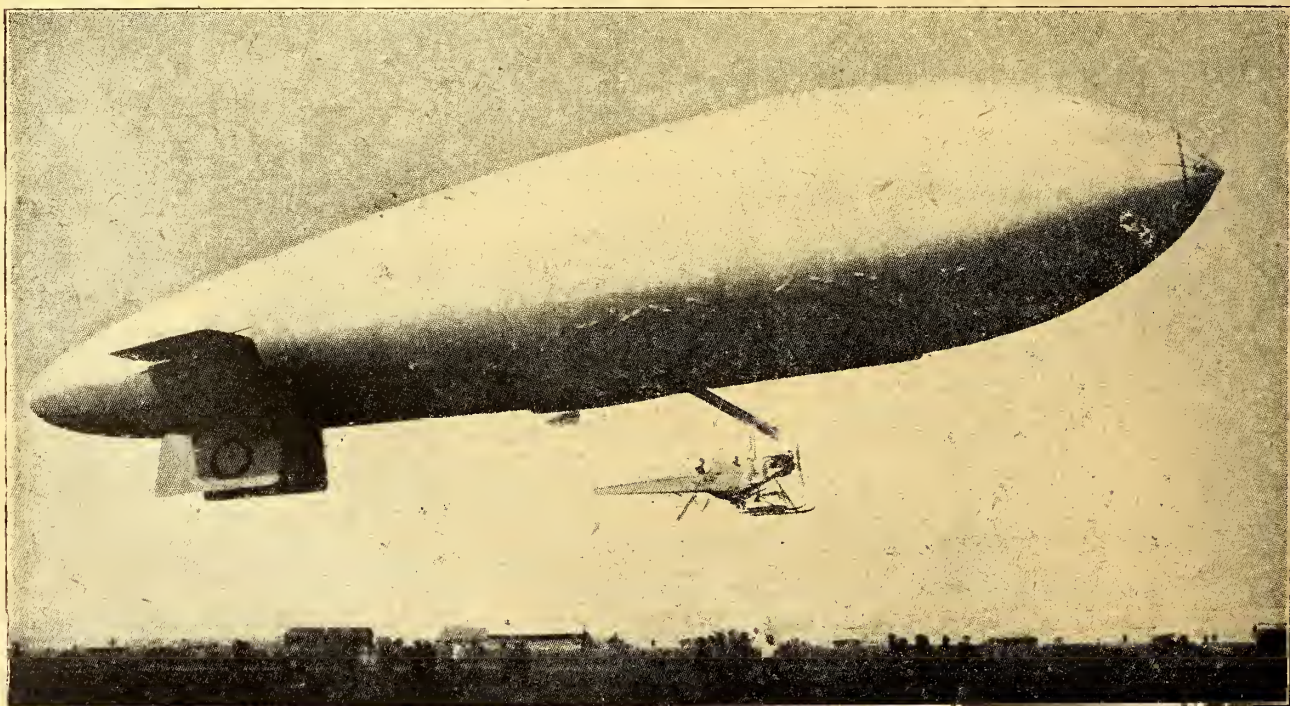
airship officers went over to the Navy with their airships, while others took up aeroplane work.

During 1914 a good deal of airship work was undertaken by the Naval Air Service as far as the available funds would allow, the two best ships in use being a Parseval bought from Germany and an Astra-Torres bought from France. These two ships—particularly the Astra—were very fast, and were of some practical use for war purposes. As a matter of fact during the first dark month or so of war they contributed very largely to the safe transportation of the British Expeditionary Force to France by maintaining an almost unceasing patrol between Dover and Flushing and along the Channel on the look-out for enemy craft.

It is, of course, impossible to say much of what the Royal Naval Airship Section has done since war broke out, but it is possible to mention briefly the small "Submarine Scout" airships, so many of which have been seen over London and on the East and South coasts. These small craft are non-rigid airships, consisting merely of an envelope and air ballonet, from which is suspended a tractor aeroplane fuselage.

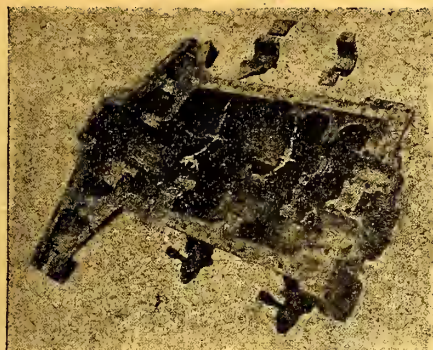
The "S.S." airships, or "Blimps," as they are known in the Naval Air Service, have done extremely useful work as scouts in different parts of the world, within the limitations of a small airship, although as a matter of fact they are probably the fastest and most efficient things of their kind in the world.

Incidentally, there seems to be some indirect connection between the word "Blimp" and a well-worn jest of the R.N.A.S. that they had discovered the only effective method of making a 70-h.p. B.E. climb—but that is a matter for etymological experts



One of the small "S.S." Scouts, commonly known as "Blimps," 1915 type.

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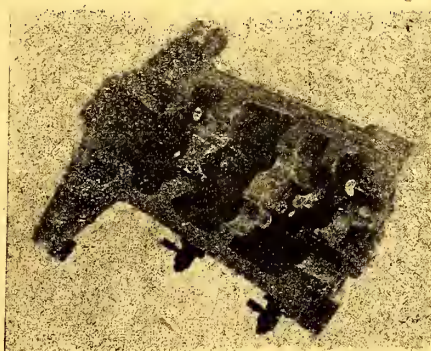
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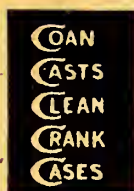
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(Continued from page 786.)

CREERY.—Killed in air fight, on Oct. 20th, 1916, Cuthbert John, Sec. Lt., R.F.C., second son of Andrew McCreight Creery and Anna Creery (née Hulbert), of Vancouver.

DAVIS.—Killed in action, on Oct. 20th, Reginald Davis, Sec. Lt., R.F.C., late Alberta Dragoons, youngest son of R. H. Davis, Lawn Cottage, Great Holland, Essex.

DREWERY.—Sec. Lt. A. B. Drewery, R.F.C., killed, was the only son of Mrs. Drewery, 2, Fernley Road, Sparkhill, Birmingham. Educated at St. John's School, Sparkhill, he gained a foundation scholarship at Camp Hill Grammar School, and also the Yardley Governors' exhibition. He was the winner of many certificates and honours at the Municipal Technical School, and after serving an apprenticeship with Kynoch (Limited), was employed at the works of Willans and Robinson, Rugby, and the Wolseley Motor Company, Birmingham. In 1913 he was elected graduate of the Institution of Automobile Engineers.

When war broke out he had been for nearly two years in partnership in a motor agency at Scarborough, but immediately enlisted in the Army Service Corps, Mechanical Transport. He was 10 months in France with heavy lorries, and being made sergeant, was nine months with field ambulances. In March, 1916, he applied for a commission in the Royal Naval Air Service, but not being successful he went to a flying school at his own expense, and obtained his certificate in six weeks, after which he obtained his commission in the R.F.C., and on July 1st went to the front.

GLORNEY.—Killed in action, on Oct. 25th, Sec. Lt. Ernest Edward Glorney, R.F.C., youngest son of the late George Glorney and Mrs. Susan Glorney, of Dublin, aged 28 years.

Mr. Glorney was educated in Dublin as a mining engineer. He graduated from Columbia University, New York, and the Royal School of Mines, South Kensington, and was a member of the Institute of Mines and Metallurgy. He followed his profession in North and South America, South Africa, and Nigeria. At the outbreak of war he held the position of mining engineer and manager of the Renang Tin Mining Company, Siam, which position he gave up in order to return to England and join the Royal Flying Corps. He received his commission early this year.

IRVINE.—A verdict of accidental death was returned on Oct. 25th at the inquest on the body of Lt. W. H. Irvine, R.F.C., who was killed through falling with his machine at Sidbury Hill on the same morning. No one saw the accident to Mr. Irvine, but Capt. Russell spoke of dispatching him a quarter of an hour before the accident. He was a very capable flier, and had been up in the same machine five times during the previous week. The body was pinned beneath the wrecked machine. Lt. Rome said he flew in Mr. Irvine's machine on the night of Oct. 24th, and it was in perfect order then.

He was the only son of Mr. and Mrs. H. O. Irvine, of Southerndown, Bridgend, Glamorgan. He was educated at the Old Hall, Wellington, Shropshire, and at Malvern. After leaving school in December last he matriculated at London University, after which he was employed at a munition factory. He enlisted in the Royal Fusiliers in May, and got his commission in the R.F.C. in July, and received his wings on Sept. 28th.

MANN.—Reported missing since Aug. 9th, 1916, now reported killed on that date while on patrol duty. John Anderson Mann, M.C., Lt., Scottish Rifles, attached R.F.C., aged 21, eldest son of Mr. and Mrs. John Mann, 14, Windsor Terrace West, Glasgow.

Information has been received that Mr. Mann was shot down along with his pilot when on patrol duty over the enemy lines. He was 21 years of age, and was educated at Ardvreck, Charterhouse, and Trinity College, Cambridge. Mr. Mann was the best rifle shot of his year in the Public Schools. On the outbreak of war he was gazetted to the Scottish Rifles, and joined the R.F.C. in March last. Shortly afterwards he and his pilot distinguished themselves by bringing down eight German aeroplanes in seven days. They were each awarded the Military Cross for consistent gallantry and skill. Mr. Mann was the eldest son of Mr. John Mann, chartered accountant, of Glasgow and London.

MARCHANT.—Killed in action on Oct. 22nd, 1916, Francis G. W. Marchant, Sec. Lt., Royal West Kent Regt. and R.F.C., aged 19, only son of Frank and Frida Marchant, of Woodside, Hayes Common, Kent.

Mr. Marchant was educated at Eton and Sandhurst, and received his commission in the R. West Kent Regt. on Oct. 19th, 1915, but joined the R.F.C. the same week. He trained at

Farnborough and Netheravon, and went overseas on March 30th of this year.

MITCHELL.—Sec. Lt. J. S. Mitchell, R.F.C., was the only son of Colonel and Mrs. Mitchell, of Sandygate, Wath-on-Dearne, Rotherham. He was educated at Bramcote School, Scarborough, and Rugby, leaving there in July, 1914. He went for a tour to Australia and Canada, returning in July, 1915, when he began to work on munitions at Sheffield. Last January he applied for a commission in the R.F.C., and was gazetted in June, being appointed a Flying Officer on Sept. 4th. He died abroad of injuries accidentally received on Oct. 5th, aged 20. It was his intention to follow the profession of a mining engineer.

NOPS.—Lt. Thomas Waldegrave Nops, R.F.C. (killed on Oct. 21st), was the fourth son of Mr. and Mrs. Edwin Nops, of Brentwood Lodge, Surbiton Hill, and was 24 years of age. Educated at King's College, he entered the service of Messrs. Higginson and Co., the well-known City bankers.

Joining the Public Schools Corps at the outbreak of the war, he was gazetted to the East Surrey Regt., and afterwards transferred to the R.F.C.

In a letter the Commanding Officer states that Mr. Nops was in the air in a kite-balloon with an observation officer, when the balloon was suddenly attacked by an enemy aeroplane. Instead of hurrying to the ground in his parachute Mr. Nops opened fire on the aeroplane with his rifle. In the excitement of the fight he did not appear to notice that the balloon had been set on fire on top, until the flames spread and the balloon began to fall to the ground. He showed the observation officer how to put the final attachment to his parachute, and told his companion to jump. The officer did so, and reached the ground safely. He expected Mr. Nops would follow, but it is surmised he had no time to escape by means of his own parachute. He fell with the balloon, and was killed instantaneously.

PARTRIDGE.—Capt. Partridge, R.F.C., was killed on Oct. 25th as the result of an accident to his aeroplane. The machine fell in a field near a town, and the aviator was instantly killed.

PATTERSON.—Sec. Lt. Aubrey F. A. Patterson, R.F.C., who is unofficially reported as having died of wounds while a prisoner of war in Germany, was born in 1895. He was the youngest son of Mr. and Mrs. W. R. Patterson, of 40, Cleveland Square, Hyde Park. Educated at Berkhamsted and Eastbourne College, he distinguished himself as an athlete, and won the swimming championship at Eastbourne when he was 16.

Within a few days of the commencement of the war he enlisted in the H.A.C., and went out to France at the end of 1914. Returning invalided to England in 1915, he was appointed to a commission in the West Yorkshire Regiment, and was subsequently attached to the R.F.C.

He went back to the front this year, and became actively engaged in bombing operations, in which he did "excellent work." He was brought down on Sept. 17th by a numerous German squadron, and died of his wounds at Osnabrück.

ROBERTS.—Lt. Cecil Roberts, R.F.C., reported missing, was well known in Liverpool as a swimmer. He won the Mersey Defences Swimming Championship in June, and carried off the Lord Mayor's gold medal in the officers' race.

THOMAS.—Killed in action, on Sept. 6th last, Sec. Lt. Cyril L. S. Thomas, The Border Regiment and R.F.C., only beloved son of Mr. and Mrs. Llewellyn E. Thomas, of Ceylon, aged 19 years.

WELSFORD.—Killed in action on Oct. 20th, 1916, George Keith Welsford, Lt., R.F.C., aged 24, eldest son of Mr. and Mrs. J. H. Welsford, formerly of Hoole House, near Chester (now a hospital for wounded soldiers).

Sec. Lt. George Keith Welsford, R.F.C. (killed in action), was the eldest son of Mr. J. H. Welsford and Mrs. Welsford, of Carlton Gardens and Marfield House, Iver Heath, Bucks. He was educated at Bilton Grange and at Harrow. He was a keen member of the Harrow O.T.C., and was the School champion light-weight boxer and a School swimmer. At the outbreak of war he was sugar-planting in Demerara. He returned home immediately and enlisted in the Royal Engineers as a dispatch rider. He went to the front in June, 1915. He was gazetted Sec. Lt. in the R.F.C. in June, 1916, and was posted as a fully qualified observer a few weeks ago. Mr. Welsford was 24 years of age.

WHITEMAN.—An inquest was held on the body of Lt. Whiteman, R.F.C., on Oct. 25th. Capt. Collins said it was his first trip alone. He had successfully come through his dual-control test

and was quite a capable pilot. The machine was seen to be in difficulties above Parkhouse. It glided from a great height to within 150 feet of the ground, when it turned and nose-dived to earth.

* * *

On Oct. 24th an inquest was held by the East Kent Coroner upon the body of Cecil Edmond Tombs, an Air Mechanic Observer in the R.F.C. Evidence was given that the deceased went up in an aeroplane with Lt. Mytton, R.F.C., as pilot, and when the machine had reached a height of 300 feet it side-slipped and dived to the ground. The pilot was seriously injured, but the observer was killed.

Capt. Douglas Joy, R.F.C., stated that the machine was a tractor biplane about nine months old. He had examined the machine himself the previous day, and it appeared to be in serviceable condition. The usual verdict was returned.

ENGAGEMENT.

The engagement is announced between Capt. C. E. H. Medhurst, Royal Inniskilling Fus. and R.F.C., and Christobell Elizabeth, youngest daughter of the Rev. and Mrs. T. E. B. Guy, Fulford Vicarage, York.

MARRIAGES.

BOYD-DAVIES.—The marriage arranged between Philip Bientinck Boyd, Sec. Lt., Gordon Highlanders, attached R.F.C., elder son of Mr. and Mrs. Gamble Boyd, Toronto, Canada, and Dorothea, youngest daughter of Mr. and Mrs. Ridler Davies, Montreal, Canada, took place at St. Paul's, Knightsbridge, at 2 o'clock, on Oct. 28th.

* * *

JONES-JOTHAM.—On the 25th inst., at St. Matthew's Church, Bayswater, Capt. Melvill Jones (R.F.C.), son of Mr. and Mrs. Benedict Jones, The Red House, Ashted, Surrey (formerly of Birkenhead), to Dorothy Laxton, elder daughter of Mr. and Mrs. F. C. Jotham (late of Kidderminster).

* * *

MOSLEY-LEIGH-STIRLING-COOKSON.—The marriage arranged between Captain Mosley-Leigh, R.F.C., and Miss Olive Stirling-Cookson will take place on Nov. 7th, at All Saints, Ennismore Gardens, S.W., at 2 o'clock. There will be no reception, but all friends will be welcome at the church.

* * *

TAYLOR-BENNETT.—On Oct. 26th, by special licence, at St. Paul's, Long Lane, Finchley, by the Rev. S. B. Mayall, Sidney Taylor, R.F.C., son of Mr. and Mrs. Taylor, of "Gleniffer," Finchley, to Florence Eliza, younger daughter of Mr. and Mrs. Arthur Bennett, of Moss Hall Crescent, North Finchley.

BIRTH.

RABAN WILLIAMS.—On Oct. 23rd, at Ye Olde Farm, Farnborough, the wife of Capt. Raban Williams, R.F.C., late of Angola (née Mabel Foxwell), of a son.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Oct. 24th.—On the Somme front one of our aeroplanes attacked with a machine-gun the enemy's trenches in the St. Pierre Vâast Wood.

On the Verdun front yesterday, in spite of a thick mist, our aircraft displayed activity and fought some 20 engagements. Three enemy machines were brought down—one to the north of Azannes, another near Ornes, while the third was seen to fall with a broken wing north of Romagne. Following upon an engagement fought by one of our air squadrons with an enemy group in the region of Verdun, one of our pilots came down to within about 100 yards from the ground in order to set fire to a shed and to open with his machine-gun on a motor-car.

In Lorraine two German machines were forced to come down damaged. In Alsace one of our pilots brought down an Aviatik, which fell near Cernay.

Yesterday our bombarding planes dropped three heavy-calibre bombs on the railway station of Spincourt and about 20 on enemy bivouacs at Azannes.

Army of the Orient.—Two enemy aeroplanes were obliged to land in a damaged condition after fights with our pilots in the region of Goritza-Primeti (Southern Albania).

Oct. 25th.—Between 11 in the morning and 1 in the afternoon of Oct. 23rd 11 British bombardment aeroplanes, accompanied by five protecting aeroplanes, bombarded the blast furnaces of Hagondange, on which they threw 1,300 kilogrammes (about 1½ tons) of projectiles. As the result of this raid several fires were caused.

The aviators were able to observe that the bombardment carried out the previous night at the same place by the French aeroplanes had had good results, much damage having apparently been done.

Oct. 26th.—A German aeroplane was brought down in the

region of Vauquois, in the neighbourhood of our lines, by the fire of our motor guns.

One of our pilots attacked from a height of about 300 ft. an artillery column on the road between Conflans and Etain and threw the drivers into disorder. The latter fled, abandoning their teams.

Oct. 27th.—Last night our bombarding aeroplanes dropped 40 bombs on the railway station of Grandpré, eight on the railway station of Challerange (both north-west of Verdun), and 30 on enemy bivouacs at Fretoy-le-Château and Avricourt, north of Lassigny (in the Somme region), where two fires were seen to break out.

On the same night 10 of our machines dropped 240 bombs of 120 mm. on the railway station of Conflans (on the Metz-Verdun railway), and 30 bombs of the same calibre on the railway station of Courcelles (south-east of Metz). Many projectiles struck their objectives.

Another of our machines dropped six shells on the railway line at Pagny-sur-Moselle (south of Metz).

Oct. 30th.—(The Army of the Orient).—A German aeroplane was brought down in our lines.

GERMANY.

OFFICIAL COMMUNIQUÉS.

Oct. 24th.—Bombs have again been dropped on the fortress of Bukarest.

Oct. 26th.—On Tuesday night our airships successfully bombed the railway works at Fetesti, west of Tchernavoda (on the Roumanian side of the Danube).

* * *

It is reported from Berlin that Capt. Bölcke was killed on Oct. 28th, when attempting to land in the German lines, after colliding with another machine. Capt. Bölcke, during a fighting career of about a year, had destroyed forty Allied aeroplanes, which must represent the record for any belligerent pilot.

Bölcke's fate is merely another example of the parable of the pitcher and the well, but it is strange that he should have found his fate in what was apparently an accident.

An unauthenticated report says that he was shot down by a British aviator.

Lieut. Bölcke (as he then was) received the written congratulations of the Kaiser when, in March, 1916, he put out of action a 12th aeroplane. It was reported in May last by German Main Headquarters that he had shot down, south of Vaux, his 14th enemy aeroplane, and late in May he was promoted to captain. In June, after he was reported to have brought down 18 enemies, the "Matin" stated that he had been defeated by Adjutant Roger Ribiere on the Verdun front, but the "Frankfurter Zeitung" subsequently stated that he was "in good health." In an interview with that paper Capt. Bölcke gave his opinion of British aviators. He described them as "brave and tenacious sportsmen," and added, "Our newspapers often say that it speaks badly for British airmen that they are so often shot down behind the German lines. On the contrary, that is the best proof of their intrepidity."

The R.F.C. and the French Service d'Aviation, though doubtless relieved to hear of his death, will certainly regret the death of a gallant and sportsmanlike enemy, and would have much preferred that he should merely have been put out of action for the duration of the war.

* * *

It is reported that the Zeppelin Airship Company has increased its capital from 1,500,000 to 3,000,000 marks (£75,000 to £150,000).

ITALY.

OFFICIAL COMMUNIQUÉ.

Oct. 23rd.—Taking advantage of the fine weather, aircraft were active. An enemy aeroplane was shot down by our aviators, and fell in flames near Biglia, south-east of Gorizia.

Austrian seaplanes dropped bombs over the Caorle Lagoon at the mouth of the Tagliamento without doing any damage. A French aviator belonging to one of our squadrons succeeded in destroying one of the enemy's machines.

ROUMANIA.

OFFICIAL COMMUNIQUÉ.

Oct. 27th.—At Hugis an enemy aeroplane was brought down by our artillery.

It was reported on Oct. 27th that enemy aviators again bombarded Fetesci (opposite Cernavoda) the previous day, killing wounded men in hospital.

128 French aeroplanes have arrived in Roumania.

* * *

It was reported by the "Wireless Press" on Oct. 27th that four British aeroplanes and eight aviators had arrived at Bukarest, coming from the island of Imbros, 312½ miles distant, and making the flight in five hours.

BULGARIA.

OFFICIAL COMMUNIQUÉS.

Oct. 23rd.—A German seaplane descended behind the enemy's front on the aerodrome near the village of Caracoum and destroyed two enemy aeroplanes, after having killed the soldiers on guard. The seaplane returned safely.

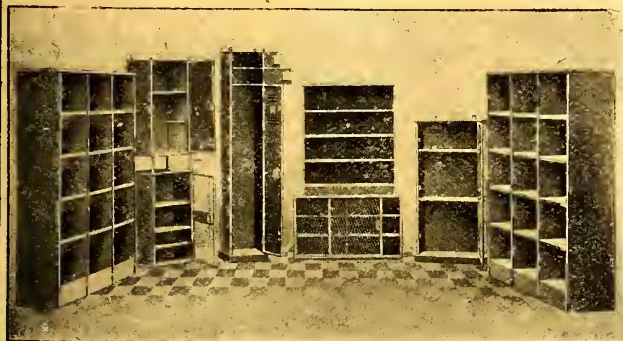
[Presumably, the machine was "amphibious." If the story is

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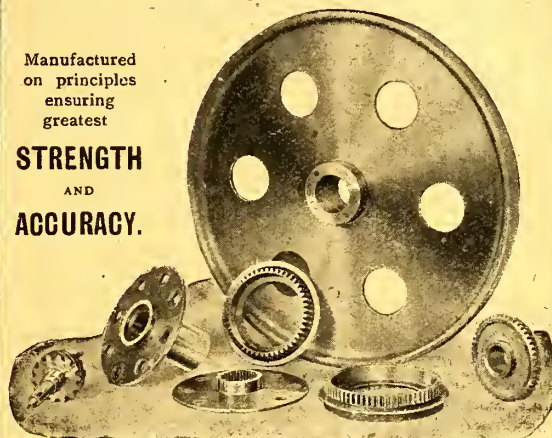
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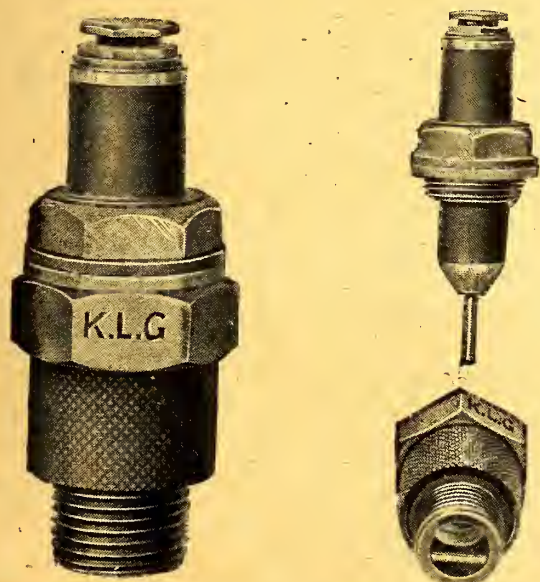
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true in all respects the feat was a very enterprising one. Still, "descended" does not necessarily mean "alighted."—Ed.]

Oct. 24th.—A German aviator, after a half-hour air engagement, brought down near Drama a British biplane of the Nieuport model, the pilot of which, wounded, and the observer, unwounded, were captured.

RUSSIA.

It is reported that the news that the evacuation of Constanza had begun was brought to Odessa by Russian seaplanes, which made the flight from Constanza to Odessa in 3 hrs. 10 mins.

HOLLAND.

A report from The Hague on Oct. 24th states that it is suspected that the Zeppelin which travelled across Holland on Oct. 22nd was spying, as it cruised just above a portion of an important new Dutch canal route.

* * *

It is reported that a German monoplane flying very low passed over Dutch territory on Oct. 25th and disappeared in a north-westerly direction.

* * *

The recent reconnoitring trip of a Zeppelin over Holland is characterised by the "Telegraaf" as a hostile act against which protests are useless. The paper demands a larger number of anti-aircraft installations, and calls for aviators to be stationed near spots which have special importance for the Germans, in order that when a Zeppelin appears over Holland strong military measures may teach the Germans to refrain from such undesirable visits.

From further reports it appears that this particular Zeppelin came from Belgium, and travelled very slowly at an altitude of from 1,000 to 2,000 feet. It would thus seem that the possibility of error is precluded, and that the Zeppelin commander must have been acting in accordance with definite orders. She was supposed to be spying on a new Dutch military canal system.

NORWAY.

It is reported from Copenhagen that Zeppelins were sighted from the Norwegian west coast on the night of Oct. 24th steering northwards.

GREECE.

It is reported from Athens that a German aeroplane from Smyrna flew over Chios on Oct. 24th and dropped three bombs. The casualties were one killed and two wounded.

SERBIA.

According to an article by G. Ward Price at Salonika on Oct. 24th, which was published in the "Times" of Oct. 26th, the Bulgarians, with the remembrance of their own cruelties to the Serbians weighing on their minds, at first feared to surrender, their impression being that the Serbians would not take prisoners. To show them that there was no danger in surrendering the Serbians had photographs taken of long files of Bulgarian prisoners drawing rations, with a loaf of bread under their arm and a bowl for soup in their hand. Two thousand copies were printed, and the Bulgarians who had surrendered were invited to write messages on them to their comrades, saying how they had been received. The 2,000 picture post-cards were then dropped by aeroplanes into the Bulgarian lines. Since then surrenders have been much more frequent and prisoners always try to bring with them a copy of the photograph, which they regard as a sort of safe-conduct. One man said that he had paid 15f. (12s.) for his, and carried it always with him in case he should be captured.

* * *

Mr. G. Ward Price, in a message dated Oct. 28th, records the use by the French of two kite balloons on the Serbian front.

AIRCRAFT IN THE HOUSE.

October 24th, 1916.

ROYAL FLYING CORPS.

OFFICERS' FLYING PAY.

Major Hunt asked the Secretary of State for War why it is that if a wounded Flying Officer succeeds in bringing himself and his aeroplane back into the British lines, and thus saves himself from being taken prisoner and his machine from being captured by the enemy, he is deprived of flying pay after a short time in hospital, whilst a Flying Officer, whether wounded or not, coming down within the enemy lines or in a neutral country is given flying pay till the end of the war?

Mr. Forster: Flying pay, like other forms of special corps pay, is continued to officers who suffer the crowning misfortune of being imprisoned or interned. In other cases, special consideration is given to cases of injury due to flying, but the orders on this subject were found to have been overlooked in some cases, owing to the rapid growth of the corps. Action to correct this, including review of past errors, was taken in September last.

Mr. Billing: Would the hon. Gentleman state whether or not the flying pay of an injured officer who succeeds in getting back wounded with his machine ceases when he comes out of hospital unfit or continues?

Mr. Forster: It continues as long as the officer is on sick leave on full pay. As my hon. Friend is probably aware, the length of sick leave on full pay differs in differing circumstances. It rests largely, I think, with the commanding officer to settle how long sick leave on full pay should continue. I think there was some

misunderstanding as to how far commanding officers' power was properly exercised. Attention has been called to it, and I hope the matter is in order now.

Mr. Billing: Would the hon. Gentleman consider the fairness of allowing cases of officers who are so injured to receive their flying pay so long as they remain in the force for the duration of the war, and thus put them on the same basis as those taken prisoner?

Mr. Forster: I do not think we can make an exception in favour of Flying Officers.

FROM DENMARK.

The German Aircraft Works as department of the Gothaer Waggonfabrik A.G. have participated in the formation of the large works "Bayerische Waggon-und Flugzeugwerke" at Fürth in Bavaria, for the manufacture of railway waggons and aircraft, while the city has placed at disposal for aerodrome grounds of 300,000 mm. size.

* * *

The Hannoversche Waggonfabrik A.G. has started an aircraft manufacturing department at Hannover-Linden, and the Anglo-Austrian Bank has, together with the Austrian Fiat works and the Maschinen-und Schiffbau A.G. Ganz-Danubins in Budapest, formed the Ganz-Fiat Aero Motor Co., Ltd., with a joint stock of £100,000.

* * *

Lieut. Wintgen, being one of Germany's best pilots, was killed recently in an engagement with British aircraft, the details of which reads thus:—In the morning of 25th September, the tragic accident occurred, an eyewitness reports, when at 10.20 noon Lieut. Wintgen started on an important patrol flight, accompanied by his friend, Lieut. Höndorf and some other aviators.

Having risen to an altitude of almost 12,000 ft. he was suddenly attacked by a surprising fire, two British Martinsyde biplanes having managed to approach close covered by the sun, giving full fire of their machine guns. Lieut. Wintgen was unable to reply effective, and his petrol tank getting hit immediate thereupon by an exploding projectile and set on fire, his fate was doomed.

Being attracted by the shots to the danger of his comrade Lieut. Höndorf arrived for assistance, only to see Wintgen dive with burning aeroplane at furious rate. Learning thus to have come too late for intervening Lieut. Höndorf determined to try for revenge, and after some minutes' bitter fight sent the one enemy to earth as his 15th aeroplane shot down.

Lieut. Wintgen was born in Minden, Westfalen, got only 21 years old and made his first flight not till February, 1915; on the first of July of same year he finished his first enemy, and with a total of 20 stood now only second to Captain Böckle's 30 shot down. On having shot down his eighth enemy he was awarded the "Pour le Mérite" by the Emperor.—H.

THE "MINISTRY" MOVES.

The Ministry of Munitions will shortly open an instructional workshop in one of the suburbs of London for the training of workers for the production of aero-engine parts. It will be the first of its kind in England.

At this workshop there will be about 200 women pupils, who must have been through preliminary training in a munitions school. At the new workshop the material for instruction will be part of the actual production. Only picked women, intelligent, with a sense of proportion and talent for minutiae, will be chosen for this training in tool-setting. When trained they will be drafted into aircraft factories, and during training, which will take from four to six weeks, they will be paid a maintenance grant. In charge of the women will be a woman engineer, herself the daughter of a famous engineer.

It is also proposed to train women in certain forms of inspection, this being a new development of Government work. About 300 men will also be employed at the new workshop.



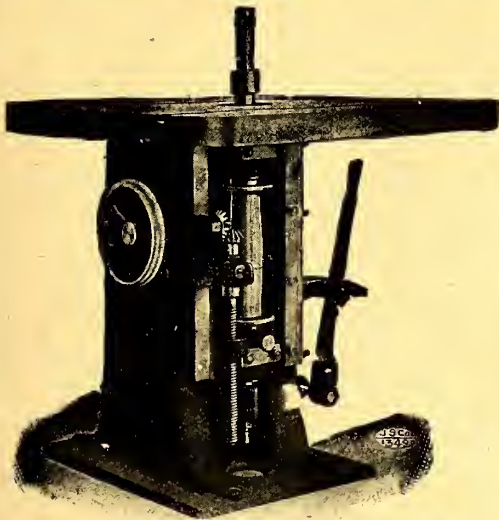
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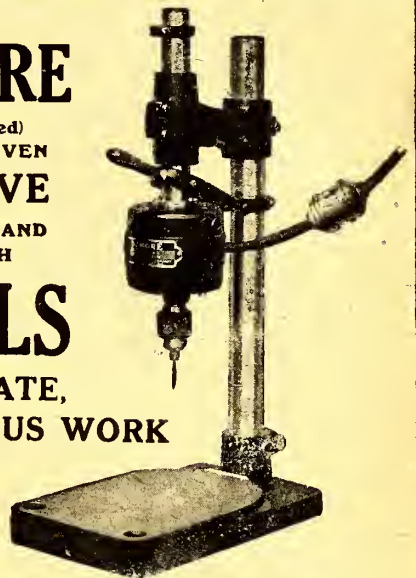
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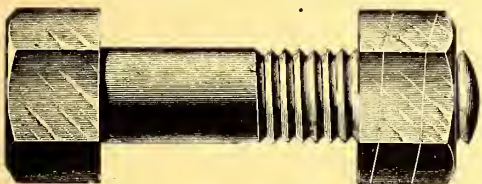


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Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

THE EUROPEAN ANALOGUE.

Coincidence really seems to come next to providence in aviation matters. I have seen no such exact instance of this as the extraordinary likeness of the new 220-h.p. V-type water-cooled Renault motor to the Wisconsin. Which of course makes the American even more interesting; since the great Billancourt firm, if not the pioneer of the type—I believe that both Ambrose Farcot and Robert Esnault-Pelterie produced such models two or three years before Renault's adopted the type—were the first to manufacture it in any great number.

[It is worthy of note that the illustrations which appear herewith and the details of the Renault engine were published over a month ago in the American journal "Aviation and Aeronautical Engineering."—Ed.]

In mass outline and arrangement scheme the two are one and the same. On the other hand, in detail, while the Renault design contains every doubtful feature and—in my opinion at least—every defective mechanical compromise exhibited in the Wisconsin, it lacks everyone of special and distinctive value—such as the duplicated lubrication scavange—which so enhance the latter's merits.

This particular Renault is said to have been designed especially

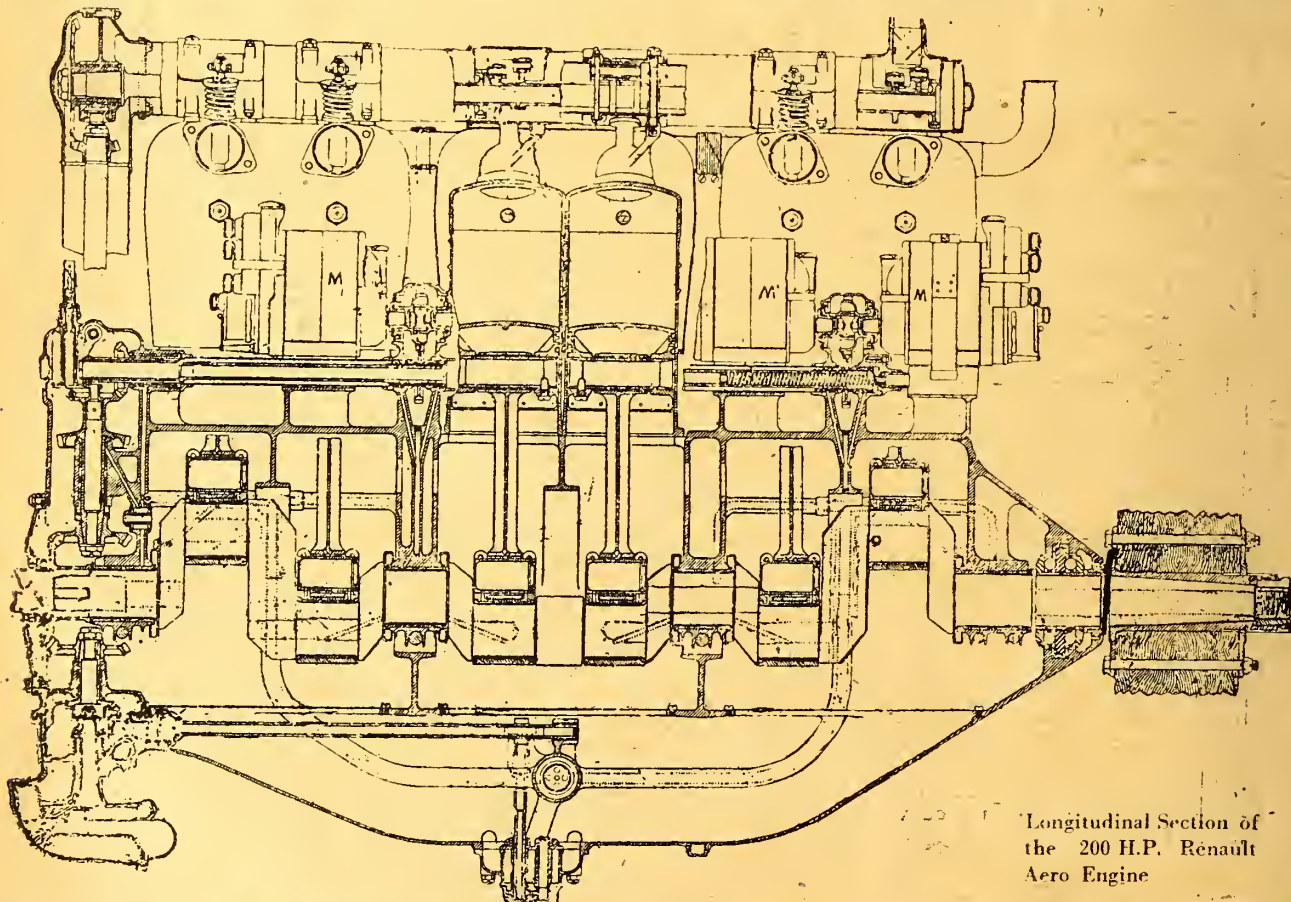
for powerful gun-carrying planes, and from all one can gather, fulfils its purpose well enough. Still I would say that a comparative survey of its design and what one knows of British abilities and actualities, let alone possibilities, is quite reassuring.

The Renault cylinders in this case have a bore of 125 mm. (4.92 inches) and a stroke of 150 mm. (5.90 inches) and are tooled out of steel—with three rib-flanges—as separated pieces before their bottle-shaped sheet-steel waterjackets are autogenously welded upon them in pairs. So each one of a pair is separately bolted to the crank-chamber: on which each set of six is mounted, as usual, at an angle of 60 deg. from the opposite set.

As a detail that is masked by the water-jacketing, the combustion chambers are slightly minaretted in the Curtiss way. But as the valves seat direct, no provision exists for detaching a cylinder separately or without disturbing adjacent fixtures. That there is nothing to prevent a broken valve-head falling into the motor is merely incidental. The point is that for a single valve defect, everything has to come down that involves the lifting of a pair of cylinders, precisely as in the Wisconsin or any other.

THE VALVE GEAR—RENAULT WAY.

The valve-operating mechanism, too, is all but the same. That is, as to the rocker operation, the cam-shafts, however, being



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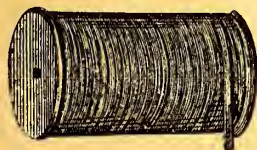
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judiciously hollowed instead of solid. The driving-gear, on the other hand, is different in detail from the Wisconsin spur-train or the conventional method. That is, from bevel-gearing on the rear-end of the crank-shaft—toothed for even turns—a short vertical shaft rises to a further set of mitre gears; one of which, in vertical relation to the driving bevel on the shaft, drives a long hollow spindle from which the two groups of magnetos, fore and aft, are spur-gear-driven. The other two gears—the mitres—in mesh with the same driving bevel, each drives a diagonal shaft up to a two-to-one bevel-gear reduction to its camshaft.

Below the crank-shaft, from the original inwardly reversed driving bevel, a similar short vertical shaft drives the centrifugal water-circulating pump, which is well-placed at the lowest point. But in mid-length, this vertical shaft drives and carries bevel-gearing to drive a hollow horizontal spindle, running forwards to the middle of the base-chamber, well below the crank-line, there to drive the main oil-delivery pump—which is of the spur type—through worm gearing, and also the wheel of a vertical spindle driving the auxiliary supply pump.

THAT ROD-CONNECTION AGAIN.

So much for all that is geared and driven; in which connection it only remains to say that the crank-shaft and connecting-rod arrangement—for the coupling-up of the rods on the port side of the motor—is essentially the same mechanically defective compromise as we saw in the Wisconsin design; that is, a pinning-in to a divided lug-extension above the big-end of the opposite connecting rod.

It may occur to any engineer who glances at this arrangement that to begin with, the thrust of the rods thus connected, instead of being radial to the crank-pin, as they should be, are upon the necks of the opposite rods; and that a transverse drag will be thus set up which will not only create undue wear on the bearings immediately beneath and tend to loosen cotter-bolts, but may well crystallise those rods at the very point where their greatest strength is desired.

The attaching pins too, may be screwed in—albeit the evidence to that effect is hardly visible—but if required to be a driving-fit, as they should be—will hardly stand much re-assembly—a mallet or a lead hammer not being always handy—without burring over at the ends. Altogether, apart from any further difficulty of setting up and bush-truing, this arrangement is the last in the world to stand up to continuous field-service.

Beyond which, it seems so utterly needless when a positively radial thrust, easy assembly and durability can so readily be obtained by forming Anzani-type shoes on the rods, coupled on their common bush by a couple of semi-circular bronze covers, held down to a block below by U-shaped cotters.

The actual mechanism of the lubrication having been already discussed, it only remains to say that the system in general, is a combination of forced and splash feed; in the latter respect to the cylinders only. For by the pump, the oil is first led in two streams to the crank-shaft bearings and thence through hollows in the shaft to the crank-pins; and for the rest, by separate leads to the magneto driving gears, to the valve-gear shafting, and finally to the cam-shaft casings.

The return oil falls upon the usual Renault gauze-screen, extending along the base-chamber length just below the crank-line; and the working amount is kept up to a sort of average by the auxiliary pump which draws from the supply tank.

THE RENAULT REVOLUTION?

In the matter of carburation, this astonishing French firm, for some unknown reason, have totally abandoned their former most successful "necklace" lay-out, with its twinned manifolding, inwardly of the V, running up from a carburettor with one or more mixture-trunks, pressure or oil-controlled, and a single float chamber.

They might advantageously have adopted some device with a concentric float-feed, or even two of the kind—in view of the

increase of size—or, again, conjoined both in a two-jet affair, with each jet feeding its own mixture-trunk; and in either case, completed the mixture-circuit by uniting the manifolds at the farther end, forward. None of which arrangements would have encumbered the middle of the motor, or the magneto-grouping, in any shape or form. And the result would have been worthy of their education and experience.

Instead of which they have gone about appropriating the commonest of ducks from Wisconsin or Wolverhampton, hanging out two many-branched manifolds on the outer sides, taking the exhausts up into a weariful stack of tubes along the inner sides.

Well, as I said before, the sight of it all renews confidence in the future of the British aeromotor industry, since there are few of us, I hope, that do not know better practice than this. It is something in mitigation that the carburettors are hot-water jacketed, and their float-chambers transversely set. Only had the arrangement been reversed, how much more conveniently could the carburettor have been jacketed with the more constant temperature of the exhaust?

There is also something to be said for the neat way in which the water-connections are made between the jacket-ends, with short rubber unions: Benz-fashion, but with nothing so adequate as the Benz ring to secure them. But since those two whacking valves per cylinder need all the cooling they can get, and the physical idea is to keep heads cool and walls warm to the end of the stroke, one may point out that reversing the flow—that is to say, leading the water in at the top and taking it hot from the jacket-bottoms—would probably have given a better power-rendition.

As it is, when you come to think of it, on the well-known formula result of P.D. = $D^3 \times 0.7854 \times SN = 1,348$ cubic inches, 220 h.p. at 1,200 r.p.m. hardly seems much for any enterprising Johannisthaler to write home about. One day, possibly some British designer, throwing back to Clement practice of ten years ago, may reverse the conventional water-flow direction and astonish us all.

The ignition arrangements—the mechanical operation of which has already been described—appear to be reliable enough. For there are four magnetos fitted, in two groups between the cylinder rods. Of these, in each case, one magneto fires the inner plugs of one row, while the other fires the outer plugs of the opposite one. So, even should one group wholly break down, the motor will still be fired.

(To be continued.)

THE ROYAL AERO CLUB.

On and after to-day, Nov. 1st, until further notice, members of the King's Services will be elected to membership of the Royal Aero Club without entrance fee. One hopes that a notable increase in the membership will result.

CONGRATULATIONS.

ROE.—On Oct. 20th, to Mr. and Mrs. A. V. Roe, High Firs, Bursledon, Hants—a daughter.

THE SHORT BROTHERS' WORK.

One of the curiosities of aviation is the part played in its development by firms of brothers. The Wright Bros., the Voisin Bros., the Short Bros., the Roe Bros., the Farman Bros., the Borel Bros., the Thomas Bros., the Lebaudy Bros., the Séguin Bros., the Renault Bros., are all eminent cases in point, and one could probably find many more. Of these the Short Bros., of London, Eastchurch and Rochester, are by no means the least eminent, for not only are they to-day a great manufacturing concern, but they were the first business firm established in this country exclusively for the manufacture of aircraft.

Starting somewhere in the dark ages as makers of balloons, they became official balloon purveyors to the Aero Club of Great Britain—long before it became the Royal Aero Club.

I believe that in those early days, Mr. Horace Short, the head of the firm, was not actively concerned in aeronautical manufac-

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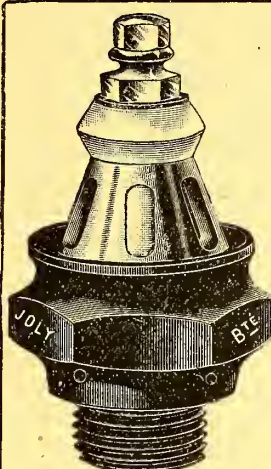
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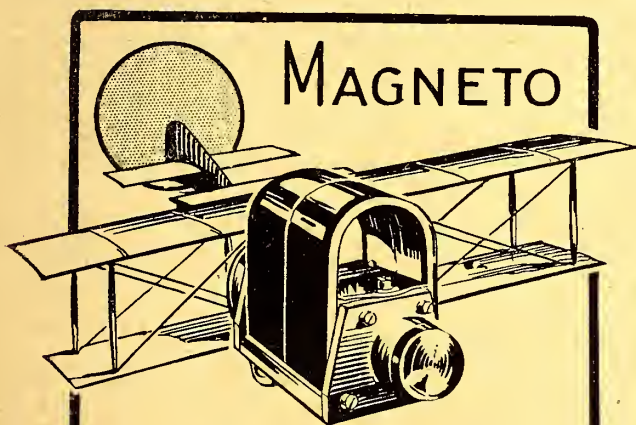
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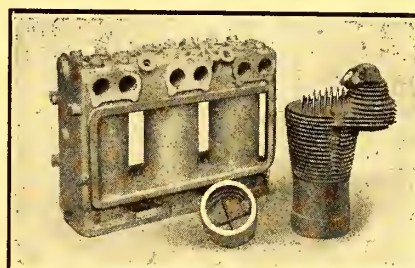
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turing affairs, being busy inventing turbines, for he was then working in collaboration with Sir Charles Parsons, and was considerably responsible for the success of the Parsons turbine. Thus, he conferred his first benefit on humanity, though some people hold that he cancelled it out by inventing thereafter that deadly weapon the "auxetophone."

However, in 1908, he and his brothers became interested in the Wright aeroplanes, and became British agents and manufacturers of these machines. Later, they designed better machines of their own, and to-day the Short seaplane is regarded by the powers that be at the Admiralty as the latest, if not the last, word in hydro-aeroplane design and construction.

The spread of interest in airships, where the R.N.A.S. is concerned, has naturally revived the balloon section of the Short Bros.' work, which seemed likely to fall into a state of innocuous desuetude, and it is even rumoured that Short airships may not be long, in point of time, and may yet be very long in linear measurement, before they meet the eyes of the public.

The firm is certainly reaping the reward of its pioneer work, for it stands very high in the esteem of the authorities, and those who have watched the firm's strenuous efforts in the early days of official neglect hope to see it maintain its present high position. Mr. Horace Short at Eastchurch, Mr. Oswald Short at Rochester, and Mr. Eustace Short at Battersea, may be relied upon not to permit the firm's work to deteriorate. In Mr. Parker—once one of the finest pilots in the Naval Air Service, and, unfortunately, invalidated out before the war—the firm has a London representative who worthily upholds the Short reputation.

In the early part of the war the Short products did splendid work, and one may expect the later products to be equally prominent, or even more so, towards the end of the war.

THE GENERAL AVIATION CONTRACTORS, LIMITED.

The statutory meeting of the creditors of the above-named Company was held at 48, Watling Street, E.C., on Tuesday, the 24th inst., when practically all the creditors were present, either personally or by proxy.

The liquidator (Mr. W. A. Casson) presided, and a resolution was passed confirming his appointment as liquidator.

An alternative resolution was proposed by representatives of Mr. Domenic Lawrence Santoni to the effect that an application should be made to the Court for the appointment of another liquidator, but this was negatived on a vote.

The liquidator stated that there were very few creditors of the Company, and that he expected that all bona fide claims would be paid in full.

He stated that the Company now had no business to carry on as its interests in other companies had been disposed of and the goodwill of its aviation business had been sold to the General Aeronautical Company, Limited, directly after the commencement of the war.

Litigation was pending against Mr. D. L. Santoni for an account of his dealings with certain of the Company's interests in the Societa Anonima Construzione Aeronautiche Savoia and the Agenzia Generale Forniture Aeronautiche Italian Companies, and for the return of considerable sums of money which had been improperly paid away. An action was also pending against Messrs. Osborn and Osborn, the late solicitors of the Company, for an account of certain transactions in which they had been concerned.

The liquidator said that one of the principal objects of the liquidation was to bring to an end the influence that Mr. Santoni had exercised in the past on the Company's affairs, very much to its detriment. Of the three actions that had been brought, one of them, as far as he had been able to investigate the facts, was a very bad case indeed, and related to the transfer of a liability incurred by Mr. Santoni to the Company, although the Company never was a party to the contract. It was an action for £550 against Mr. Santoni for monies which he had improperly got from the funds of the Company, whilst he was holding the position of Managing Director. That and other actions that had been commenced against Mr. Santoni would be pursued with vigour.

The proceedings closed with a vote of thanks to the liquidator.

AIRSHIP CONSTRUCTORS.

As the current issue of THE AEROPLANE is specially devoted to the subject of Airships, it is only fitting that reference should be made to the firm of Airships, Ltd., of High Street, Merton, S.W.

This firm was founded by Mr. Holt Thomas, who also was the founder of the Aircraft Manufacturing Co., Ltd., and of the Gnome and le Rhône Company, in the days when aeroplane construction was not a commercial proposition except with a view to the future, and thanks to sound management the younger firm is turning out no less successful than what may perhaps by courtesy be called the parent company, although the two businesses are run upon quite a separate footing.

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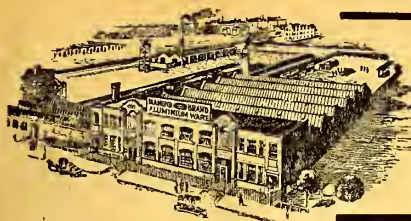
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They constructed the first British kite-balloon, and have undertaken various airship jobs, the nature of which it would be unwise to describe at the present time, and the organisation is such that the firm could start on the biggest airship job ever put out within one week if asked to do so.

Mr. Dagnall, the manager, has had experience of airship and balloon pilotage covering a period of seven years, and his assistant, Mr. Fellowes, was associated with Mr. E. T. Willows, one of Great Britain's airship pioneers for some years.

An interesting point is that 75 per cent. of the male employees have been on active service, and have either been invalided or sent home as skilled munition workers.

Airships, Ltd., do not intend to cease their activities at the termination of the war, and some very striking developments are likely to happen on the cessation of hostilities.—W. L. W.

LORD FRENCH VISITS BLACKBURN'S.

Field-Marshal Viscount French, while on a visit to Leeds on Oct. 27th, took the opportunity of making a tour of inspection round the Olympia works of the Blackburn Aeroplane and Motor Co., Ltd. Viscount French was accompanied by Brig.-Gen. H. C. Lowther, Lt.-Col. A. Fitzgerald Watt, Col. Gordon, the Hon. Rupert Beckett, Capt. P. D. Thomas (Local Secretary of the Ministry of Munitions), the Lord Mayor of Leeds (Mr. Chas. Lupton), the Lord Mayor's Secretary (Mr. J. F. Walker), and the Chief Constable of Leeds (Mr. W. Burns Linley), and other members of a large and distinguished party. Lord French was received by Mr. Blackburn, the Managing Director, and by Mr. Stuart Hirst, Chairman of the Company, and by residential Naval Officers.

The Field-Marshal showed the highest appreciation of the completeness of the company's organisation.

On his departure for other munition works Lord French was presented by the Chairman with an album in red morocco leather and suitably inscribed and containing photographs of the works.

AN HONOUR FOR CLINCHERS.

Mr. Alex. Johnston, general manager of the North British Rubber Co., Ltd., has been made a Justice of the Peace for the County of the City of Edinburgh. The North British Rubber Co., best known to the public as the makers of Clincher Tyres, are largely responsible for the supply of such parts as tyres and shock absorbers to the Flying Services, and they were among the pioneer firms to take up the manufacture of rubbered aeroplane fabric when this material was used on aeroplanes. Similar material is still produced in large quantities for airship and balloon work.

THE IMPERIALIST.

Mr. Pemberton-Billing's newspaper, "The Imperialist," seems to be going very strong, and it is somewhat amusing to learn that quite a large proportion of the subscribers are people in the Services and among the better classes generally. The paper makes highly interesting reading, as Mr. Pemberton-Billing deals extensively with subjects which are carefully suppressed by the Coalition newspapers, although it is very much in the national interest that they should be dealt with publicly. Consequently one learns quite a good deal from "The Imperialist" which one would not learn from any other newspaper.

The series of articles on public men, under the title "Before Passing Judgment," are as trenchant and as amusing as ever, and one hopes that the writer of this series will be able to maintain his present level for a considerable time, despite the fact that there are so few public men who are really worth the trouble of judging.

Those who have not yet seen "The Imperialist" can obtain a copy from Imperial House, Hertford.

A NEW AIRCRAFT FIRM.

The National Aircraft Manufacturing Co., of Printing House Yard, Hackney Road, N., have established themselves as constructors of wood aeroplane parts. The work is done under the management of one of the oldest hands concerned with aviation, who has also worked for the Aeronautical Inspection Department, so that all work is done to fine limits. The firm is now at work on an important sub-contract, but is prepared to entertain inquiries for any additional aeroplane woodwork.

FOR PRISONERS OF WAR.

The following amounts have been received during the week ending Oct. 28th for Muriel Countess Helmsley's and Mrs. Rowton's Fund for Prisoners of War in Germany:—From the employees of Vickers, Ltd., Weybridge Works, £6 12s. 3½d.; from the employees of Vickers, Ltd., Bexley Heath Works, £3 7s.

A PERSONAL NOTE.

James W. Carr and Co., Ltd., the well-known machinery tool and metal firm of 35, Queen Victoria Street, London, E.C., announce that Mr. J. Wilson, formerly of the firm's machine-tool department, is no longer connected with the firm.

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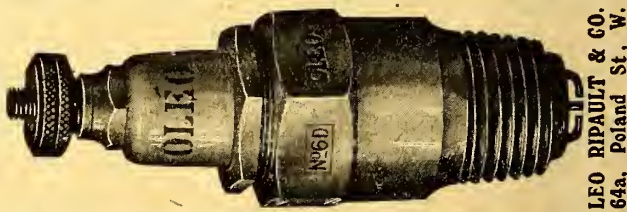
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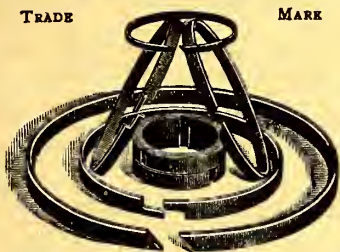
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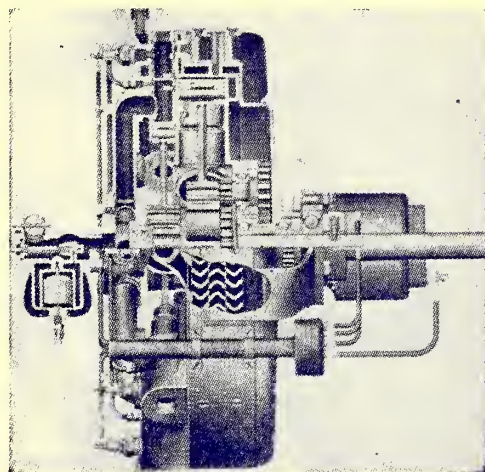
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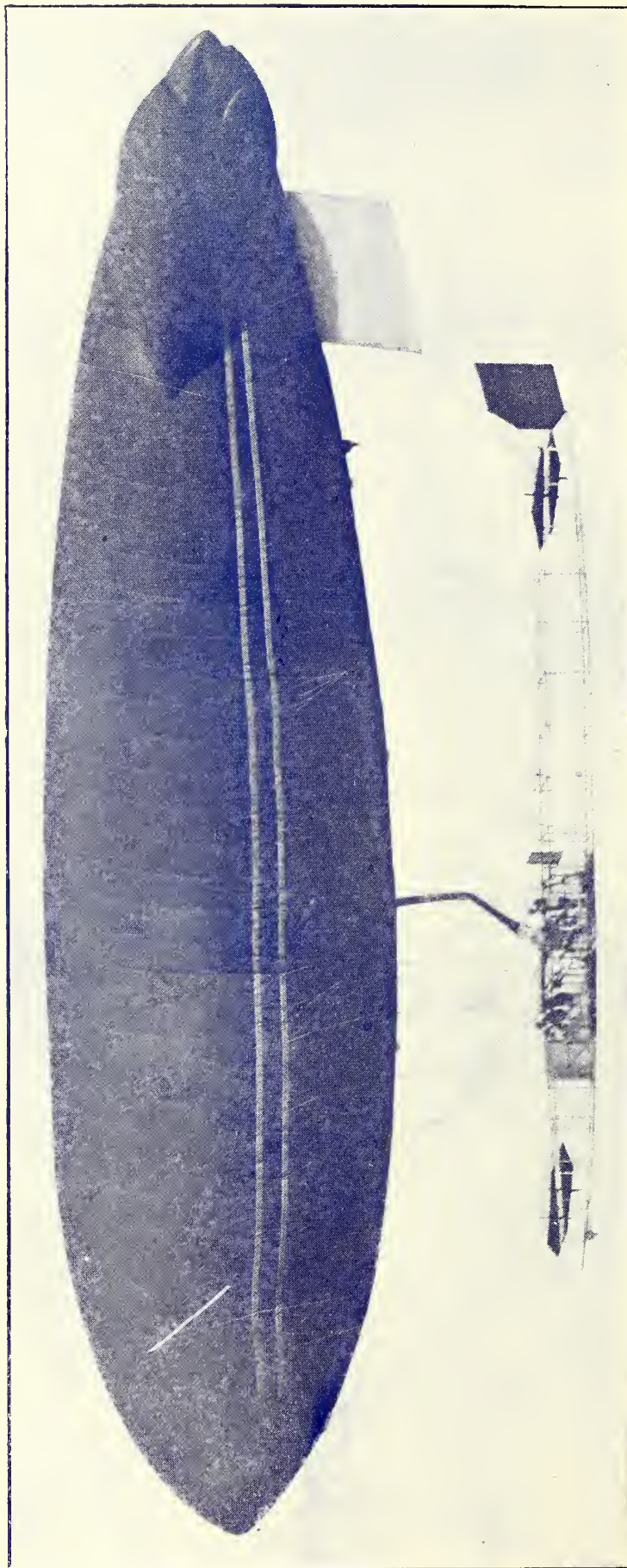
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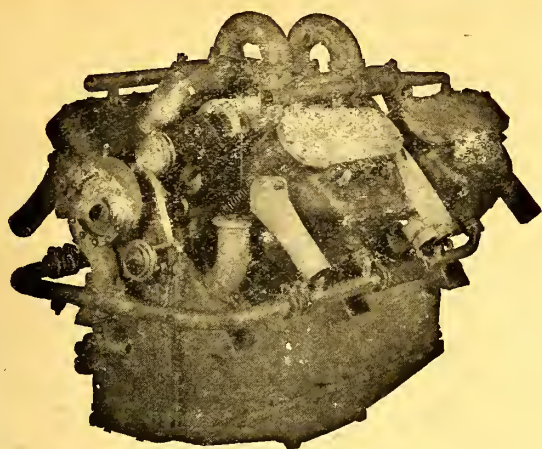
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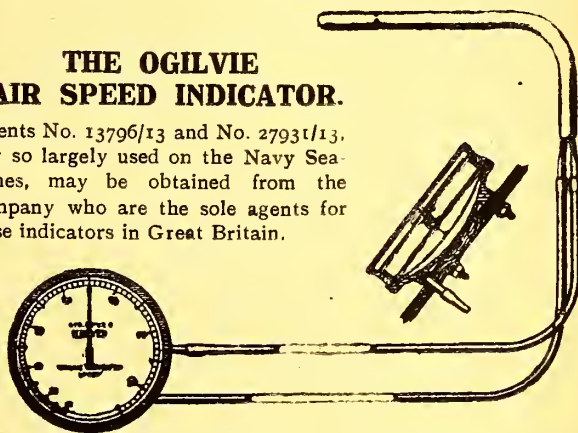


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ON COALITION AND THE FLYING SERVICES.

Something very serious is happening somewhere in this country. The British People are showing signs of waking up. One dare not go so far as to say that there are signs of dawning intelligence. But it is something to the good that those who have slumbered so long and so heavily should become semi-conscious to the fact that someone is stealing the bed-clothes and that they are likely to feel a draught as a result.

When such an eminently respectable and unimpeachably honest paper as the "Morning Post" delivers itself of the astonishing statement that "some people rise up and roundly affirm that Ministers do not really want to win the war," and when it says, "We can tell the Prime-Minister that this country intends to win the war, and that those who stand in the way will go down," one is forced to believe that the British People are feeling uncomfortable. For the "Morning Post" more than any other paper represents the solid, not to say stodgy, Upper Middle Class, which, after all, is the backbone of the Nation.

A very cynical critic might possibly ask, why should Ministers want to win the War? They have very comfortable, well-paid jobs. Several of them would be considerably worse off financially if the war ended, for the end of the war would mean the end of the Ministry. The British People generally wake up for a General Election, much as a man may wake up for a drink in the middle of the night, and during that momentary period of consciousness the Ministry would certainly be hove out with a crash.

This is the oldest Ministry on record, reckoned on its official life, and allowing that, despite the ex-Conservative additions, it is still the same Liberal Ministry which followed the Boer War. It reminds one of "Punch's" famous picture of the Oldest Inhabitant, who, when asked what he did with himself all day, replied, "Sometimes I sits and thinks, and more times I just sits."

This Ministry has been sitting for an indelible number of years, and one is not impressed by the amount of thinking it has done. That is the lamentable result of being the Oldest Inhabitant. Being superlatively old, it has no competitor, for the Oldest Opposition is now dead and buried inside the Coalition, a cannibalistic kind of sepulture. If "Punch's" Oldest Inhabitant had had a rival, he would have had less time for just sitting, and it is not otherwise in Politics.

"Competition is good for trade" is a commercial axiom. It is equally true that competition is good for Ministries or for Government Departments or for Government Officials individually.

When once a Monopoly or a Trust has become established, and all competition has been overcome, it ceases to be efficient or even useful. As Mr. Jeff Peters in the "Gentle Grafter" says, "A trust is its weakest point!" adding by way of explanation, "My remark was an epitogram, a kind of mulct 'em in parvo. The

only way to break up a trust is from the inside. Keep sitting on it until it hatches. Yes, sir, every trust bears in its own bosom the seeds of its destruction, like a rooster that crows near a Georgia coloured Methodist camp meeting." Later, in reference to the failure of one of his own efforts as a trust-constructor, Mr. Peters remarks, "It was a case of auto-suppression. There was a rift within the loot."

Which is quite sound philosophy. The interesting thing will be to see whether, if the British People, per the British Press, continues to sit on the Coalition Ministry, it will act as a trust-busting incubator.

As to the "rift within the loot," far be it from me to suggest that Ministers are getting any loot out of the war, beyond their hypertrophied salaries; but it would be very interesting to know whether, while they have been just sitting, their relatives, friends, or underlings have been quietly looting elsewhere. For instance, one would like to know why some steamship liners were commandeered at fixed freight rates early in the war, and why others were left free to drive their own exorbitant bargains. One would like to know whether anyone "in the know" made money in America on British shares after the first dispatch on the Battle of Jutland. One would like to know the truth about the purchase in America of unseaworthy motor-launches at £20,000 apiece or so, when the better work can be done by seaworthy British-built launches at nearer £2,000 each.

"When thieves fall out, honest men come by their own," and so we may get at the truth some day, through the "rift within the loot," and after the pre-war Marconi affair one is past being surprised at anything. But one hates having to wait for the Coalition-Trust-Monopoly to hatch out to bursting point while men are being killed or wrecked for life in hundreds of thousands.

WANTED, AN OPPOSITION.

What this country needs is either a great leader or a live and well-organised opposition. I am told that Mr. Asquith is a very clever man. He must be, or he would not have kept his job so long. But he is not a great leader. He is not the magneto which gives life to the nation's motor; he is merely the differential which distributes the drive—or possibly the braking effect—more or less equally between the Coalition back wheels.

Therefore we can only hang on and hope for an Opposition. Where it is to come from, Heaven knows. Certainly not from this Parliament, for all the present members, almost, are Party men, and therefore at present the slaves of the Coalition-Trust. There is not likely to be a General Election so long as the Trust can dodge it. And the daily Press, bar the Northcliffe group, belongs to the Trust. So where are you?

Nevertheless, as I have said, there are signs of awakening. Even some of the Coalition papers show it; for,

while their leading articles still maintain their "O King, live for ever!" tone, here and there one finds prominence given to matters which are by no means flattering to the Trust, under the pretext that they are news rather than politics. For instance, there is the affair of the recent meeting between Mr. Balfour and the Parliamentary Air Committee on the subject of the Air Board and its activities, or lack of them. The result of this affair may be seen from the extracts hereafter:—

THE AIR BOARD AND THE PARLIAMENTARY COMMITTEE.

Colonel W. W. Ashley, M.P., chairman of the Parliamentary Air Committee, addressed from the House of Commons, on November 1st, the following communication to the Lord Mayors, Lord Provosts, and Mayors and Provosts of county boroughs in Great Britain and Ireland:—

"Sir,—You will have observed in the newspapers this morning that Mr. Balfour met a deputation from the Parliamentary Air Committee, comprising upwards of eighty members of the House of Lords and the House of Commons, yesterday, and that there were submitted to him certain proposals for the extension of the powers of the Air Board with a view to more vigorous, more economical, and more effective production of aircraft for the immediate needs of the Navy and Army. I deeply regret to say that the attitude taken up by the First Lord of the Admiralty was, in the judgment of the Parliamentary Air Committee, unsatisfactory, and did not tend to realise the measure of co-operation and centralised control which the exigencies of the war have shown to be absolutely necessary. Following upon the meeting with Mr. Balfour, the executive of the Parliamentary Air Committee unanimously adopted the following resolution:

"In view of the discussion which took place at a meeting of the Parliamentary Air Committee at the House of Commons to-day, the executive committee unanimously reaffirms its strong conviction that the Air Board should be given more extended and immediate executive power for the development of both air services.

"I venture to appeal to you to give your powerful support to the Parliamentary Air Committee in the work it has undertaken in Parliament to strengthen the aircraft policy of the Government, more especially on its naval side. The Parliamentary Air Committee is composed of members of both Houses and all shades of politics, and in its advocacy of sounder aircraft policy contemplates no attack upon the Government or upon Ministers, but merely seeks to create that efficiency which in the view of competent experts is urgently necessary. It will be most helpful if you will be so kind as to consider the foregoing resolution, and if you approve of the action of the Parliamentary Air Committee will communicate with the Prime Minister, expressing your personal sympathy and urging that the Air Board be given adequate powers.

"I am, Sir, your obedient servant,

"WILFRID ASHLEY,

"Chairman, Parliamentary Air Committee."

SECRETS OUT.

After this came the following illuminating letter to the editor of the "Times":—

Sir,—The public would seem even yet not to be seized of the crisis that lies behind the controversy now raging between the Air Board and the two branches of the Air Service—a controversy vital to the maintenance of our present supremacy in France. Mr. Balfour has met the members of the Parliamentary Air Committee and at the close of some exquisite, if pitiful, fooling told them, as a vibrant secret, the number of cattle that had to be slaughtered in order to obtain enough gold-beater's skin to clothe a Zeppelin, omitting to add that its use for this purpose is not wholly essential. Lord Curzon, after a lapse of nearly six months, has presented to the Cabinet the result of 25 meetings of his Board, and wearily awaits a yea or nay to the ultimatum therein contained.

Meanwhile, from the front come circumstantial rumours of much-improved German machines—the near future will spell the tale in clearer language. What does all this mean? It means that, whilst we have no lack of natural fliers amongst our pilots, the shameful bickering of certain complacent and self-centred administrators at home, and more particularly in the R.N.A.S., is jeopardising and retarding that constant and unceasing progress in design which alone can give these gallant men the advantage of their superiority in courage, intelligence, and skill.

The Navy claims the prerogative of the air and resents interference in the control of this new branch, as though, forsooth, the members of the Board of Admiralty were masters of it. Yet Zeppelins cross the North Sea with almost as much ease as destroyers pass the Straits of Dover! From these strictures I

exempt the gallant band of enthusiasts whose every endeavour to throw off the shackles of hidebound myopia has been ruthlessly suppressed.

There are even rumours of resignation should the War Committee of the Cabinet insist on any change whatsoever. Sir, this species of threat is despicable in time of war, and, if it has been mooted, then I say, out with these men, for no one is indispensable, and if such exist, they least of all. The matter is urgent beyond exaggeration—how urgent I dare not write. If Mr. Asquith is the strong man that many think, he must act now firmly and fearlessly, and there is but one course open; there is no alternative, and compromise will wreck its own ends. Reconstitute the Air Board under a powerful Cabinet Minister with, as colleagues, a single representative of each Service, and yet a third from the Ministry of Munitions, upon which body the Air Service must for supply become more and more dependent.

Give to it, as the present Board asks, adequate executive power. Then and only then will our Imperial Air Service, both R.N.A.S. and R.F.C., forge ahead, safe in the definite knowledge that behind them are men who, whilst ensuring adequate output in every branch of supply, will consistently encourage and recognise that enthusiasm and patriotic endeavour which, flouted and crushed at every turn, is now in a fair way to ultimate extinction.

I have the honour to be,

SCRUTATOR.

November 2.

THE AIR-BORED.

It is fairly evident that the agglomeration of M.Ps. which, under the chairmanship of Colonel Ashley and with Captain Alan Burgoyne as secretary, has charged itself with extending the recent improvements in our aerial forces, is becoming more than a little bored with the way in which aerial affairs are being conducted in certain quarters. Hence this local revolt against the Trust and its servants.

Some time ago one who is somewhat closely concerned with the Air Board, in conversation with a person who is supposed to know something about aircraft, asked casually, "What do you think about the Air Board?" To which the latter replied, "I try not to." The attitude of this paper towards the Board has been somewhat similar.

It was recognised that time must be allowed for the able men who compose the Board to find their feet, or settle down in the saddle, or get their sea-legs, or otherwise compose themselves for their task. They and their permanent staff had to learn their job, so to speak. There was much information to collect from the Services and the Aircraft Industry alike. Plans, at first purely tentative, had to be thought out, discussed, and formulated, before there could be any question of putting them into operation. And even when they were ready to be put into operation, the Board had no executive authority with which to make them operate. The Board could only recommend alterations and approve suggestions for improvements. After that the carrying out of the plans depended entirely on the personal goodwill of the High Command of the respective Flying Services.

To men of the executive calibre of Lord Curzon and of the organising ability of Lord Sydenham such a state of affairs must have been excessively galling, and the fact that they have remained at their posts under such disabilities is witness to their high sense of duty.

Certain reforms recommended by the Board have been carried out, chiefly by the Royal Flying Corps, and the carrying out of those reforms indicates the high quality of the officers now in control of the Corps. In some important instances, undoubtedly, reforms were suggested by the R.F.C., commended by the Board, and adopted by the R.F.C. One imagines that most of the improvements in night flying arrived in this way.

The Navy, apparently, was less willing to take advice—which seems natural to anyone who knows the Navy—and consequently one sees little or no improvement in the R.N.A.S. comparable with that which General Brancker and his capable assistants have made in the R.F.C. Men and machines are kept busily doing nothing in the old casual way.

A FATAL DEDUCTION.

What should be more natural, then, to the average man, M.P. or otherwise, than that he should come to the old familiar conclusion that the Flying Services should be put under the one single control of an Air Minister? There may be some way, which my feeble brain is unable to envisage, in which a single-control Air Service might operate satisfactorily. If so, I do heartily wish that someone would enlighten me as to how it can be done.

Having lived and had my being for the past eight years entirely for, by, and with the Flying Services, I have got it firmly fixed in my head that a soldier is a soldier and a sailor is a sailor, whether on the land, on or in the sea, or in the air. One meets sailors who ought to be soldiers, and one meets soldiers who ought to be sailors, but in general the work, and the training necessary to perform that work, in the two Services is so utterly different that it has produced two utterly different types of men. Therefore a "kind of a giddy harum-phrodite" Service to combine the two jobs is impossible.

The more a man knows about his job the more he knows that he knows nothing about it. The R.F.C. flying officer who has had a few weeks on Salisbury Plain and a fortnight on active service knows all about flying, air fighting, observing, photographing, artillery spotting, and everything else, and is ready to lay down the law at once. But the Squadron-Commander who went out with the original historic "five squadrons" comes along and asks, "Do you think so and so is the right way of doing such and such a job, or would it be better to do it some other way?" On active service he does not hesitate about it, for he does it the best way he knows how; but he knows there must be better ways, and better machines or guns or bombs or cameras with

which to do it. Consequently, the more service a man sees with either the Navy or Army the less he is likely to know, and the less he is likely to want to know about the other Service. His own job is enough for his one brain to learn thoroughly. Let any reader who has served long in either Service ask himself how much he really knows about the detail work of the other.

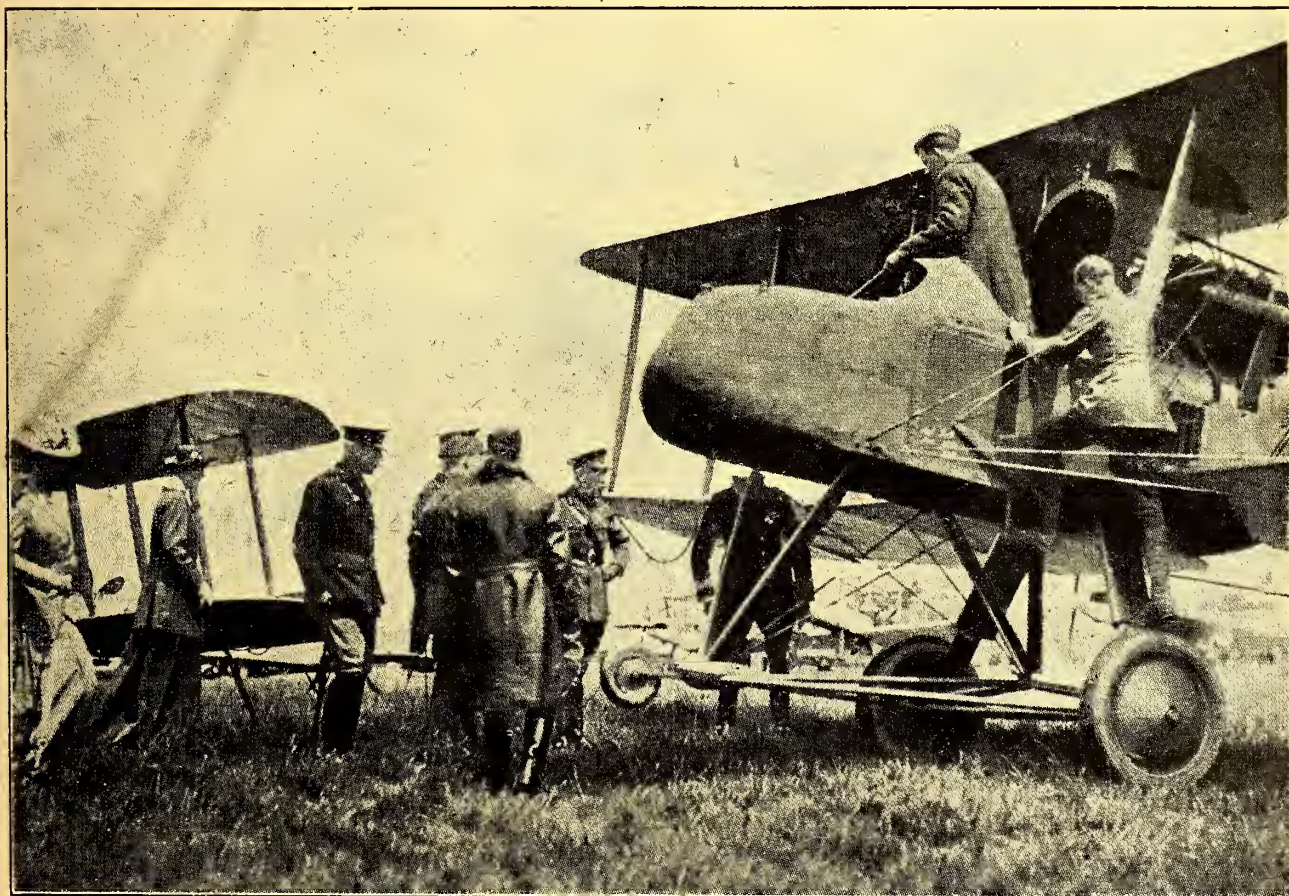
A REASONABLE PROPOSITION.

Admitting, therefore, that the personnel of the two existing Services must for ever remain separate, there is something to be said for a third and separate Air Service to begin operations where the other two leave off. Let the R.F.C. do all the Army's work to the uttermost limits of the enemy's War Zone, and let the R.N.A.S. do everything the Fleet needs it to do, and then let the new Air Service carry out offensive aerial operations beyond those essential to the strategic plans of the G.O.C. in C. in the Field, and let it defend this country against aerial invasion. That is, at any rate, a reasonable proposition.

The R.N.A.S. bomb-raiders now operating on the Continent have not the remotest connection with the Navy, and no more with the Army, yet they are helping to win the war. There ought to be a hundred of them for every one there is, and there might have been, only for some foolishness at the Admiralty.

Similarly, the night-flying pilots of the R.F.C. are not in the least assisting the operations of the Army. They live apart from the Army; they learn nothing about a soldier's job, nor about a military aviator's duties in co-operation with troops on the ground. Like the R.N.A.S. raiders, they are "air men" pure and simple.

Almost to the same degree the Anti-Aircraft people are distinct from the Navy and Army, while closely



The King and Queen visiting an aerodrome in England. The picture is reproduced from the American paper, "Aviation."

allied to the raiders and night-fliers. And, as Lord Montagu pointed out, the A.A. Corps is a useful occupation for aviators who can no longer fly.

These three branches should all be amalgamated into the Imperial Air Service. They could conduct their own manoeuvres together in peace-time, and learn from one another methods of attack, defence, and counter-attack. And learning their job properly would take them all their time, without bothering to learn anything about the Navy or the Army.

Naturally they would co-operate to any desired extent with the older Services, just as the Fleet tried to help the Army in Gallipoli by shelling alleged Turkish positions, and as it keeps Germans busy in Flanders and Bulgars busy along the Ægean by shelling the coast, and as it helps the transport of troops all over the world. But no one would for that reason suggest a coalition Navy and Army.

One might suggest the possibility of a War Ministry to co-ordinate the operations, the manning and the equipment of Navy, Army, and Air Service at the same time, and to prevent waste and clashing, while leaving the Admiralty, the War Office—thereafter to be called the Army Office—and the Air Office to do the detail work. But that would not be Coalition.

NO MORE COALITION.

We have had enough of Coalition in Politics. For Heaven's sake, let us keep away from Coalition in the Services. Think of the dire effects of removing all competition between the two Services.

Take the question of aircraft design, for example. Certain officers have real active service experience, and know what is wanted in the field. Others have spent the period of the war sitting in offices, or in influential drawing-rooms, holding down fat jobs and propounding theories. Naturally, when it comes to washing out a certain number of officers and forming a single central bureau for design work, the officers with influence behind the scenes would keep the fat jobs, and the men of experience would go out on active service again.

When there are few jobs going, the intriguers always get them; it is only when there are more jobs than intriguers at home that the first-class men get their chance as administrators. Remove competition between the Services, and the intriguers will have things all their own way.

As it has been so far, whenever one Service has been beaten by the other, through emulation and competition, it has led to people with active service experience being brought in to "ginger up" the Service which has been beaten. One of our best engines is entirely due to an officer who, though he has not had much flying abroad, has been in the Field for months, watching the performance of various engines.

Again, the vast strides which the R.N.A.S. is making in testing new types of machines and encouraging new designs, despite discouragement right at the top and despite something queer in the lower grades—which ought to be the subject of strict inquiries—are due to the importation of clever and unimpeachably honest active-service officers, who know what is wanted.

R.N.A.S. competition, in its endeavour to beat R.F.C. machines, has produced the new Sopwiths which are now doing such fine work for the R.F.C. If there had been Coalition when war broke out, both Services would now be staggering round on B.E.s. and R.E.s., and, having been at the mercy of the inferior Fokkers of 1915, would be still more at the mercy of the greatly superior Rolands of 1916. For it is evident that the Governmental Trust would have backed up the Advisory Committee for Aeronautics and its hangers-on through thick and thin, if the Reform Party had not been able to quote chapter and verse for better machines during the agitation of the first few months of 1916.

Among other things there would have been no alteration at the Royal Aircraft Factory, and the trenchant reforms which by all accounts are operating like an earthquake inside that establishment would never have taken place, or, at any rate, would not be happening at this early date.

Therefore, by all means, let competition continue, but let it be properly regulated. It is entirely praiseworthy that one Service should try to produce an engine or an aeroplane which is able to beat anything the other Service has produced, but it is altogether wrong that each Service should try to prevent the other from knowing what it is producing, or that it should try to corner supplies of material.

UNITY IN PRODUCTION.

The one point on which something approaching Coalition might be arranged is in the unification of production. At the present moment the Ministry of Munitions controls both labour and material in aircraft factories, but it has no control over the uses to which that labour and material is put. If some high-browed scientist in either Service persuades an untechnical senior officer to order the product of some crazy brain-wave of his in quantities, the Ministry cannot step in and stop it because it is wasting man-hours and material, and that is precisely where control of some kind is needed.

Just how such things are arranged between the Ministry and the Admiralty and the War Office in the production of shells and guns is beyond my ken, but the fact is evident that shells and guns are produced in something like adequate quantities and of adequate quality. If that can be done, why cannot the Ministry regulate aircraft output in a similar way?

It is rather the fashion to laugh at the Ministry. It is said that, if one stands outside any one of its many offices and shouts "Jones!" at least three heads will appear at every window. A member of Parliament has even asked in the Commons what is now the population of Wales since the Ministry was formed. Be it so. The object of the Ministry is to provide the consumer—who is the Navy or Army—with the goods he wants, and to get them as expeditiously as possible from the producer. If you want to see that line of business being carried on in a superlatively efficient manner, take a walk along Oxford Street, and read the Welsh names on the shops. The reason for the Almighty's creation of the Welsh race is not always obtrusively evident. Perhaps this is why.

THE ADMIRALTY OBSTRUCTIONIST.

It appears that the chief obstacle to the unification of production and to the proper utilisation of the R.N.A.S. alike is the Board of Admiralty. Their Lordships are said to treat the R.N.A.S. with "supercilious contempt" and to treat the Air Board with hardly veiled antagonism.

Perhaps the R.N.A.S. has itself to blame, for it has not endeared itself to the real Navy. Only the other day a *pukka* N.O. remarked to me that his wife would like him to buy one of those nice cosy Naval "British Warm's," but that he really could not do it, because he might be mistaken for an R.N.A.S. officer if he wore it. The incident is trivial, but it shows the feeling which exists. Still, blame the R.N.A.S. as you like, the blame rests primarily on Their Lordships, who refused to let the Director of the Air Department, in the early days of the R.N.A.S., have a sufficient supply of first-class Naval Officers to impart the proper Service tone to the new drafts.

Even during the war Their Lordships have done nothing observable to encourage the production of men or material for the R.N.A.S. Things which needed to be done immediately, if at all, were hung up, awaiting high and mighty approval, and were consequently left undone, or were done too late. Some day, if the Censor dies before I do, I am going to tell a few stories about

. The .

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the Navy which ought to help to explain and excuse the R.N.A.S.

The proper thing to do with the R.N.A.S. is to take it right out of the hands of the Admiralty and put it under the control of the Air Board, as the nucleus of the Imperial Air Service. Then the Admiralty could beg back the seaplanes and such officers as might care to remain in the Navy, and use that remnant as the nucleus of the real Naval Air Service, which will exist purely for Fleet and harbour work, some day when the present incubus of fossilised notions of stick-and-string Admirals and extinct political volcanoes are alike removed by the death-dealing scythe of time.

A SIMPLE SCHEME.

Perhaps one may venture to set forth a brief outline of a suggested scheme—subject, doubtless, to very many emendations and alterations to make the pieces fit together—which might flatten out the existing obstructions and confusions.

Leave the R.F.C. alone as regards organisation and operations. There is precious little the matter with it in these respects under the present control. It might, however, be the better for a reconstruction of its technical side, by sending some of the senior people abroad to learn more about active service conditions. There are probably vacancies for technical advisers with the R.F.C. in Mesopotamia or Darfur, and engines and aeroplanes would well repay inspection in the climates of those countries. The junior technical officers, having had active service experience, could doubtless carry on adequately in the meantime.

Take all the wheeled aeroplanes away from the R.N.A.S. and hand them over to the Air Board for the Imperial Air Service, and let the Air Board take over also all aerial offensive and defensive operations and operatives, including anti-aircraft gunnery and gunners.

Leave the Admiralty its seaplanes and such officers and men as might wish to remain, and let the Admiralty also control airships, as being of more value to the Fleet than for any other purpose.

Let the Ministry of Munitions control the output of aeroplanes and engines, on the same lines as those on which it controls other munitions.

Let the Services decide what types of aeroplanes and engines they need, and let the Ministry see that they get them. Only thus can competition and friction and grabbing between the Services be prevented.

AN ALTERNATIVE METHOD.

It has been alleged in some quarters that the Ministry of Munitions is arbitrary in its methods and does not produce efficiency. That would seem to depend chiefly on the personality of the individual official charged with the department concerned. Naturally, before handing over aircraft production to the Ministry, it would be advisable to ascertain the truth of these allegations, but one cannot conceive that any official of the Ministry could be more arbitrary and less efficient in their methods than several of the Admiralty's officials and some of those from the War Office.

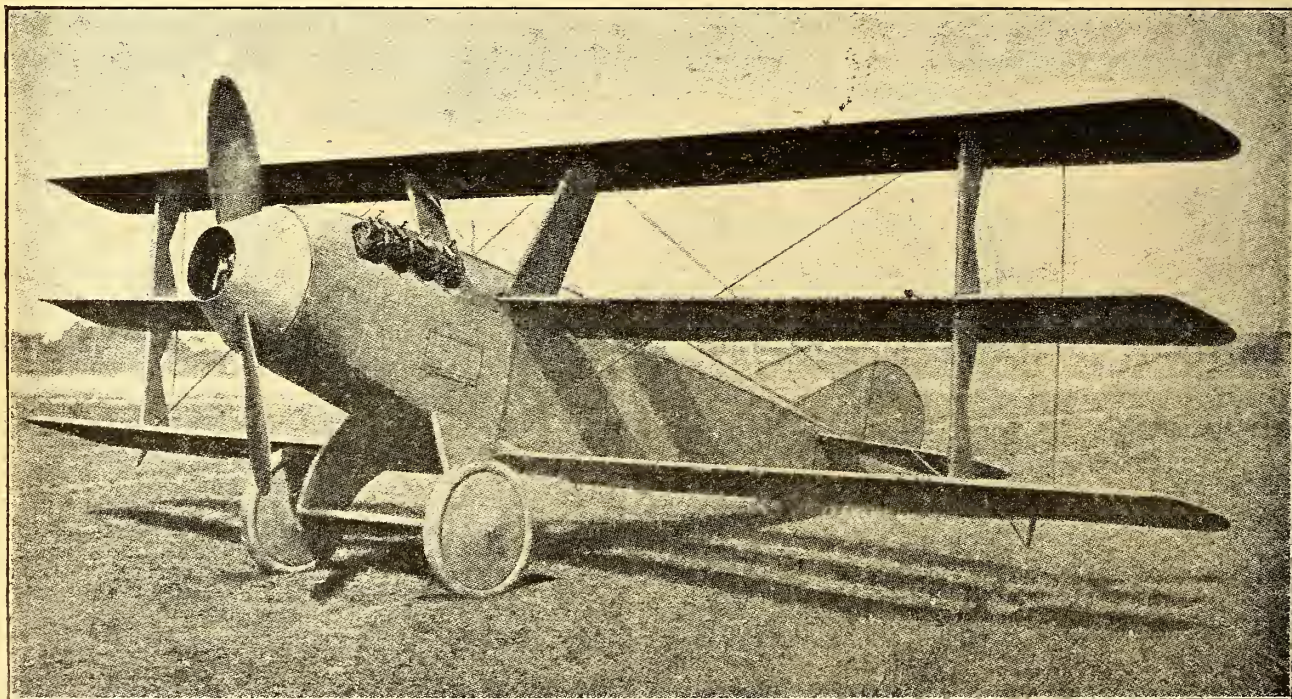
If, however, it were found that the Ministry could not take over the work properly, there always remains the alternative of centralising production in the hands of the Air Board. But, if that were done, the Air Board would have to give up all idea of executive control over personnel and operations, and would have to confine itself to being a supply department. Also, the Naval and Military representatives would have to give up their administrative positions on the Board.

So long as the Navy and Army both had a voice in the Board's decisions, it would be inconceivable that the Board could ever be unanimous as to the allocation of supplies. But, if the Navy and Army representatives each attended the meetings of the Board, set forth their needs and their arguments, and then retired to await the Board's decision, it seems likely that men of the calibre of Lord Curzon and Lord Sydenham could agree absolutely on decisions which would be fair to both Services.

In effect the Air Board would thus become a species of Ministry of Munitions for the Flying Services, which would have the obvious disadvantage that it would be continually clashing and competing in the labour and material markets with the other Ministry.

UNSKILLED LABOUR.

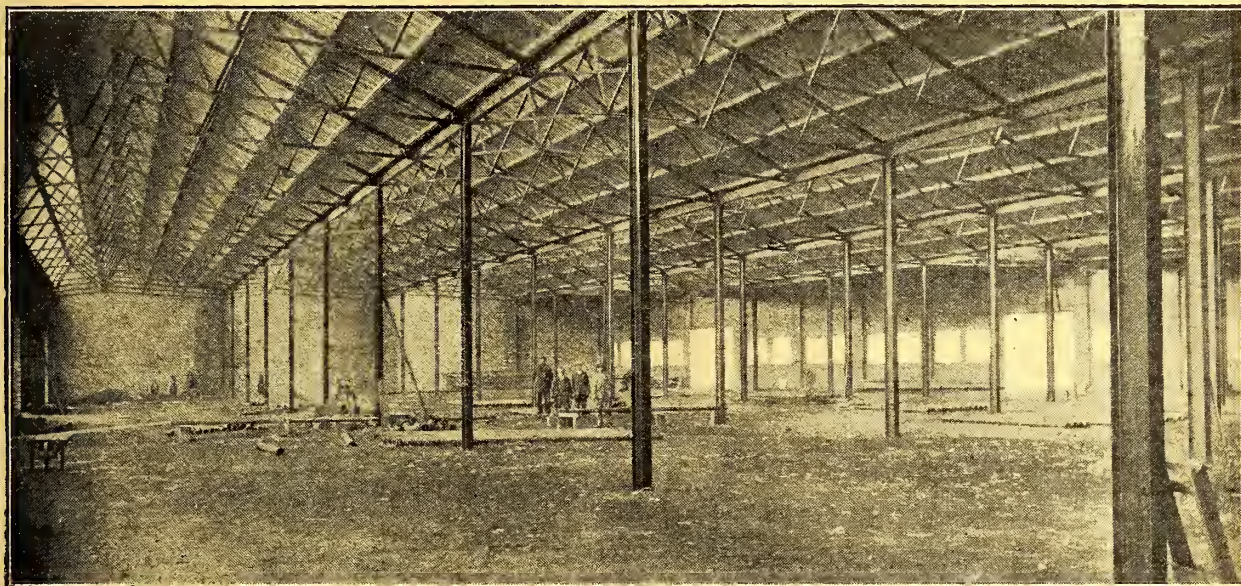
Finally, let all men in both Services be employed in actual useful aeronautical work, and let any men who



From "The Aerial Age," New York,

The new Curtiss Triplane Scout, which has a claimed speed range of from 45 to 115 miles per hour, with a 160-h.p. Curtiss Engine

SMART WORK



WE have just completed the factory shown in the accompanying photograph. Our guaranteed time was twelve weeks, and we finished exactly to time, although the conditions were extremely difficult. The site itself had to be made up with 5,500 tons of carted material.

NOW MAY WE QUOTE YOU?

Last week we got out a scheme and estimate for a 75,000 feet factory in two hours. We can send a representative down to see you, and before he leaves your office, by means of our standardised system of factory construction, and our index of building prices and conditions in all parts of the country, he can give you a definite proposition, including price, time and penalty, for any building work you may require.

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have no technical ability or special qualifications for aircraft work be handed over to Line regiments. All "housemaid's" work, such as washing out sheds and quarters, digging and levelling roads and aerodromes, cleaning cars, a great deal of the car and lorry driving, all the fetching and carrying of supplies, and all "fatigue" work—except as punishments—should be done by niggers. What is the use of our being the greatest "black" Power in the world if our nigger population is not used for the benefit of the Empire?

Let us revert to the old idea that the white man does the fighting and makes the nigger do the work. The French have a jest against us that, when we send one man into the fighting line we send five men to the front to feed him. Which is not strictly true, but is near enough so to show the wisdom of recruiting South African niggers to do the fetching and carrying for the R.F.C. in France. Plenty of men enlisted and paid as "air mechanics" are only doing work that niggers could do.

THE NEED FOR HASTE.

The heavy casualties of the R.F.C. of late, though not so high proportionately as they were a year ago, when our agitations began, show that we cannot be content to sit still and claim "dominance in the air," as the servile Coalition Press would have us believe ourselves to have possessed ever since war began. Germany has not been content to admit defeat in the air, and her new machines, commonly known as "Rolands," though reported by others to be built by the L.V.G. firm, are said to be again equal to the best machines which we have on active service.

We have new machines, recently produced, easily capable of beating them, but there is need of haste if our

AN UNPRECEDENTED PERFORMANCE.

Everyone who takes the slightest interest in aeronautical affairs should "make a date" on or after Nov. 20th to visit the exhibition of aeronautical pictures which is being organised by Lady Drogheda. The show will be held at the Knoedler Galleries, Bond Street, a few doors up from the Aero Club end. The original Knoedler was French, and not a Hun, so no one need have patriotic scruples. Very much otherwise, for the bulk of the proceeds of the exhibition will go to the Irish Hospitals Supply Depot, of which Lady Drogheda is the moving spirit, presiding goddess, and so forth. The only deduction from the hospitals' receipts will be that, as a recognition of the fact that the show is purely aeronautic, twenty-five per cent. of the proceeds will be given to the Flying Services Fund, which is run by the Royal Aero Club.

The *pièce de résistance* of the exhibition is Lady Drogheda's own priceless collection of aeronautical prints, which alone is worth a journey to see by anyone who is seriously interested in aeronautical history. Apart from the historical value of the pictures, the humour, satire, and even the prophetic insight, of some of them are enough to keep one amused for a day or so.

Lady Drogheda has been fortunate in obtaining the loan of a number of other very valuable prints from Sir John Shelley and Mr. Philip Gardner, both of whom have long been enthusiastic supporters of aeronautics, and many of the prints and engravings lent by these gentlemen have never been exhibited before.

Mr. Mortimer Singer, one of the earliest members of the Aero Club, has lent for the exhibition his fine collection of aeronautical paintings, most of them unique pictures which few people outside his personal friends have even seen.

Mr. Behrens, also, has lent his unique collection of coloured engravings of aeronautical subjects, and the original painting of the famous picture of Vincent Lunardi.

Mr. John Lavery, the eminent painter, has lent some pictures he has done of aeronautical subjects, and Mr. Wyllie has lent his well-known picture of "The Fighting Line from Ypres to the Sea," as seen from an aeroplane—the original sketch having been done by his son, now a Major R.F.C.

Besides these Lady Drogheda with her usual energy and persuasiveness has succeeded in extracting a number of other interesting pictures from private collections, and has even commandeered sundry valuable prints from the Royal Aero Club.

Altogether the show should be well worth seeing, and, considering that it will be the first thing of its kind ever done, there will be quite a lot to see. One hopes that all readers of THE AEROPLANE who are within reach of Bond Street during the week beginning Nov. 20th will make it a point of honour to visit the Knoedler Galleries.—C. G. G.

new machines are to arrive abroad before the Hun aviators become too much of a nuisance or danger.

Let us set up as a warning the historical fact that Fokker monoplanes, admittedly inferior machines, were shooting down our unfortunate aviators on B.E. biplanes in January and February and March of 1916, although greatly superior machines existed in this country in June of 1915.

Let us put an end to all unfinished contracts for obsolescent machines. It is cheaper to scrap parts, finished or unfinished, than it is to scrap finished machines, as has been done with machines which were merely finished in order to complete a contract, although they were known to be useless.

An energetic policy, both at home and abroad, is needed if we are to maintain our dominance in the air. The G.O.C. R.F.C. in the Field, General Trenchard, has done magnificent work. He and the junior officers commanding R.F.C. detachments elsewhere have performed miracles with the material at their disposal. Officers commanding R.N.A.S. detachments have been even worse served by the technical people at home, and yet they have done well, when permitted to do anything worth while. But these officers must be supported with adequate supplies of new and improved aircraft, just as the Army has been supplied with new and improved guns.

Let us hope that the Air Board and (or) the Ministry of Munitions may provide the material without petty bickering, and thus may put an end to what is colloquially known among aviators as "hot-stuffing" of the material for one Service by the officers of the other. But in abolishing noxious competition let us at all costs avoid the deathly stagnation which results from Coalition.

C. G. G.

THE S.B.A.C.

The Aircraft Industry should note that the general management of the business of the Society of British Aircraft Constructors is in the hands of a Committee of 14 members of the Council.

The present Committee of Management is as follows:—

Mr. H. White Smith (Chairman of the Society), the British and Colonial Aeroplane Co., Ltd.

Mr. B. Caillard, Wolsley Motors, Ltd.

Mr. R. O. Cary, The Sopwith Aviation Co., Limited.

Mr. L. Coatalen, The Sunbeam Motor Car Co., Limited.

Mr. Hamilton Fulton, Martinsyde, Ltd.

Mr. N. G. Gwynne, Gwynnes, Ltd.

Mr. E. B. Parker, Short Brothers.

Mr. E. W. Petter, Westland Aircraft Works.

Mr. H. V. Roe, A. V. Roe & Co., Limited.

Mr. J. D. Siddeley, The Siddeley-Deasy Motor Car Co., Limited.

Mr. G. Holt Thomas, The Aircraft Manufacturing Co., Limited.

Mr. H. T. Vane, D. Napier & Son, Limited.

Major H. F. Wood, Vickers, Limited.

Mr. Howard T. Wright, J. Samuel White & Co., Limited.

An Aircraft-Engine Section of the Society has been formed and all Aircraft Engine matters are referred to this Section, the present Committee of which is as follows:—

Mr. G. Holt Thomas, Gnome & Le Rhone Engine Co. (Chairman of the Section).

Mr. W. H. Allen, W. H. Allen, Son & Co., Limited.

Mr. A. F. Bennett, Messrs. Willans & Robinson, Limited.

Mr. B. Caillard, Wolsley Motors, Limited.

Mr. L. Coatalen, The Sunbeam Motor Car Co., Limited.

Mr. A. H. Roy Fedden, Brazil, Straker & Co., Limited.

Mr. N. G. Gwynne, Gwynnes, Limited.

Mr. L. J. Le Mesurier, Sir W. G. Armstrong, Whitworth & Co., Limited.

Mr. F. May, Green Engine Co., Limited.

Mr. J. D. Siddeley, The Siddeley-Deasy Motor Car Co., Limited.

Mr. H. T. Vane, D. Napier & Son, Limited.

A Technical Section of the Society has also been formed, for which Technical Representatives are nominated by Members. It is desired that the constitution and scope of this Section shall be as unrestricted as possible, the object being to obtain the assistance of all Members—both Ordinary and Associate—on technical matters.

Other Sections of the Society will be formed as and when they are required. It is believed that there are many directions—commercial and scientific—in which the Society will be of use and importance to its Members and to the public.

The Treasury has been consulted under the Notification of the 18th January, 1915, and raises no objection to this issue. It must be distinctly understood that in considering whether they have or have not any objection to new issues, the Treasury does not take any responsibility for the financial soundness of any schemes, or for the correctness of any of the statements made or opinions expressed with regard to them.

FELLOWS MAGNETO CO. LIMITED.

Contractors to the War Office.

Among the numerous "key" Industries held by the Germans in Pre-War days, one of the most important was the Manufacture of Magnetos. Magnetos are an essential part of every Motor-car, Aeroplane, Transport Lorry, Motor-boat, and Farm, Field, or Factory Petrol or Gas Engine.

As accurately made as a Watch, wrought and stamped of special metal and materials, each Magneto yields an intense spark every definite fraction of a second. Each Cylinder of a Petrol Engine as it compresses its charge of Air and Petrol Vapour takes in its turn a new impulse from the explosion caused by the LIGHTNING SPARK of the MAGNETO.

It is a marvellous piece of mechanism—complex, yet perfect. Its very intricacy, the skill required in its Manufacture, and the partly secret materials used, render its production a highly specialised and most profitable branch of Industry.

THE DEMAND FOR MAGNETOS.

The Demand is great. Nearly £200,000 worth of Magnetos were sold each month in England before the War. Two powerful German Companies, who controlled the Market, have grown great on the profits they obtained.

But as every German Industry—no matter how technical—can be mastered, so the Manufacture of Magnetos has been perfected in this Country.

FELLOWS MAGNETO CO., LIMITED.

From a small Magneto Repair Shop the Business of Fellows and Company, now "Fellows Magneto Company, Ltd.," has developed. The story of the rise of this Firm is a striking example of the British spirit of Perseverance in overcoming difficulties.

The shortage of the necessary Metals and Materials, the scarcity of the intricate automatic machinery needed, and the absence of skilled labour had to be faced. Costly and continuous experimental work had to be undertaken. The cramped conditions under which urgent Magneto Repairs had to be carried out at express speed were not the least of the troubles which the Firm experienced. Notwithstanding these serious difficulties, a British Magneto was finally produced, equal in every respect to the German product.

A BRITISH-MADE MAGNETO.

For nearly a year now FELLOWS MAGNETOS have been supplied. Each Magneto, before leaving the Factory, undergoes most stringent tests, and the results are a proof that the FELLOWS MAGNETO is a machine of the highest possible efficiency and durability.

The success attained shows unflinching determination in the face of exceptional difficulties on the part of Fellows and Co., in laying the foundations of a business which, in the future, should rank high among the Manufacturing Concerns of this Country.

THE EXTENSION OF THE BUSINESS.

The Orders received for FELLOWS MAGNETOS, the requirements of the British Government, and the Trade Opening that exists, induced the Firm to purchase a modern Factory at Park Royal at a cost of over £8,000. Orders have been placed for large extensions and for additional machinery. Further Capital is needed to take advantage of present opportunities.

AN ISSUE OF £50,000 IN £1 SHARES,

entitled to an 8 per cent. Cumulative Preferential Dividend each year, and to 20 per cent. of the further distributed Profits of the

Company, is being made. It is estimated that an output of 50 Magnetos per day (i.e., half the proposed output of the new Factory) will permit of a Dividend from 10 per cent. to 12½ per cent. being distributed on these Cumulative Preferred and Participating Shares, after allowing for Excess Profits Duty, and setting aside a substantial sum for Reserve and Depreciation.

This rate of Dividend will increase as the Output and Profits of the Company expand.

At the full output of the new factory, which should be reached within a year from date, the net profits should approximate to OVER £30,000 PER ANNUM, AFTER DEDUCTION OF EXCESS PROFITS TAX. THIS WOULD PERMIT OF 16 PER CENT. BEING PAID ON THE PREFERRED SHARES and £6,000 BEING SET ASIDE FOR RESERVE AND DEPRECIATION.

ORDERS IN HAND.

Large Government Orders are in hand. France, Russia, and Italy urgently require Magnetos. The great demands of the Home Motor Trade and of our Dominions and Colonies have also to be satisfied.

The past year's earnings, according to the certified figures given in the Prospectus of the Company, show the profitable nature of the business.

ISSUE OF CAPITAL.

Only 50,000 Preferred Shares are being offered for Public Subscription, as this sum is considered sufficient for present requirements to enable an output of 100 Magnetos per day, of a value of, say, £300,000 per annum, to be produced. The market demand in England alone may be estimated at over £2,000,000 per annum in value (according to the report of the Sub-Committee of the Board of Trade), of which the Company will be in a position to take every advantage both during and after the war.

Those interested in the matter should notify their Stockbroker, or write to the West End Offices of the Company, "The Secretary, Fellows Magneto Company, Ltd., Trafalgar House, 11, Waterloo Place, London, S.W.," so that a Prospectus may be sent to them. Applications will be dealt with in order of priority of receipt.

The 8 per cent. Cumulative Preferred and Participating Shares of £1 each, entitled to 20 per cent. of the net profits of the Company, are payable as follows:—2s. on Application, 8s. on Allotment, and 10s. 3 months after Allotment. Applications can only be accepted when made on the Forms to be supplied with and on the terms of the Company's Prospectus.

THIS FORM MAY BE CUT OUT & POSTED

To the Applicant's Stockbroker, or to the Secretary

FELLOWS MAGNETO CO., Ltd.,

Trafalgar House, Waterloo Place, London, S.W.

Please send me a Prospectus of Fellows Magneto Company, Ltd. I should like to have the opportunity of subscribing for.....Preferred Shares in the Company
(Write number of shares required.)

Name and Address.....
(Please write very clearly.)

AEROPLANE.

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.

NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette" Supplement, Nov. 1st, 1916.

WAR OFFICE, NOV. 1ST.

REGULAR FORCES.—HEADQRS. OF ADMIN. SERVS. AND DEPTS.—The following temp. appts. are made at the War Office :—Dep. Asst. Dirs.—Capt. A. G. Clark, R.F.C., S.R., from a Staff Capt., vice Capt. E. R. L. Corballis, R. Dub. Fus., Aug. 12th.

Staff Capts.—Maj. I. B. Davson, City of Lond. Yeo., T.F., vice Capt. P. R. Grace, R.F.C., S.R., Aug. 1st. Temp. Capt. R. H. Brand, from an Equipment Officer, R.F.C., temp. Capt. C. M. Smith, from an Equipment Officer, R.F.C., Lt. (temp. Capt.) C. Hirtzel, R.F.C., S.R., from an Equipment Officer, R.F.C., and to retain his temp. rank while so empd., vice temp. Capt. J. S. Nicholson, Aug. 26th.

Staff Lts.—Sec. Lt. (temp. Lt.) H. F. Anns, Lond. R., T.F., from an Asst. Equipment Officer, R.F.C.; Sec. Lt. S. Whitechurch, R.F.C., S.R., from an Asst. Equipment Officer, R.F.C.

ESTABLISHMENTS.—R.F.C.—Sqdn. Comdr.—Capt. A. K. H. O'Brien, 2nd D.G., S.R., from a Flt. Comdr., and to be temp. Maj. whilst so empd., Oct. 4th.

Flt. Comdrs.—From Flying Officers, and to be temp. Capts. whilst so empd.:—Sec. Lt. (temp. Lt.) A. F. K. White, Suff. R., T.F.; Sec. Lt. (temp. Lt.) G. H. Hall, Welsh Horse Yeo., T.F.; temp. Lt. S. R. Stammers, Gen. List; temp. Lt. J. T. Milne, Gen. List; temp. Lt. J. R. Allan, Gen. List; Sec. Lt. W. A. McCloughry, 9th Regt., Australian Light Horse, Oct. 1st. Sec. Lt. (temp. Lt.) C. R. Clapperton, Clyde R.G.A., T.F., Oct. 18th.

Flying Officers.—The notification in "Gazette" of Sept. 25th, regarding Lt. G. A. Garveys-Gadd, R.F.A., S.R., resigning his appt. as a Flying Officer, is cancelled.

Equipment Officers, 1st Cl.—Temp. Hcn. Capt. T. B. Morley, and to be temp. Capt. whilst so empd.; temp. Capt. D. Thomson, Gen. List; Lt. D. B. Sanders, R.F.C., S.R., from an Asst. Equipment Officer, R.F.C., and to be temp. Capt. whilst so empd.; Sec. Lt. S. Clark, R.F.C., S.R., from an Asst. Equipment Officer, R.F.C., and to be temp. Capt. whilst so empd., Aug. 26th.

Equipment Officers, 2nd Cl.—Sec. Lt. E. N. Layton, S.R., from an Equipment Officer, 3rd Cl., and to be temp. Lt. whilst so empd., Oct. 10th.

Equipment Officers, 2nd Cl.—Sec. Lt. A. C. Blackmore, S.R., July 12th. Lt. O. I. Preston, Notts and Derby R., T.F., from a Flying Officer (Observer), July 17th. Temp. Sec. Lt. J. M. Macaulay, Gen. List, Aug. 1st. Sec. Lts., S.R.:—P. A. Barron, Aug. 10th. H. Lloyd, Sept. 25th. N. Martin, Oct. 23rd.

ROYAL REGIMENT OF ARTILLERY.—R.H. and R.F.A.—Sec. Lt. to be temp. Capt.:—F. Coxen, whilst empd. with an Anti-Aircraft Co., Aug. 26th.

R.G.A.—Lt. (temp. Capt.) T. O. Ockleston, T.F., to be temp. Maj. whilst comdg. an Anti-Aircraft Co., Aug. 26th.

To be temp. Capts. whilst empd. with an Anti-Aircraft Co.:—Sec. Lt. (temp. Lt.) A. Hardy, T.F., Aug. 17th. Sec. Lt. W. B. Brittain, E. Riding R.G.A., T.F., Nov. 2nd. Temp. Sec. Lt. (on prob.) C. J. D. Symons to be temp. Lt., Nov. 2nd.

MEMORANDA.—Capt. J. Valentine, R.F.C., Spec. Res., a Flt. Comdr., R.F.C., to be temp. Maj. (without pay and allowances of that rank) whilst specially empd., Oct. 20th.

Temp. Sec. Lt. J. C. C. Affleck, York R., is transfd. to Gen. List and to be temp. Lt. whilst serving with R.F.C., Oct. 1st.

Sec. Lts. to be temp. Lts. whilst serving with R.F.C.:—D. Bellamy, Essex R., J. E. Catherall, R. War. R., J. D. G. Macrae, Sea. Highrs., Oct. 1st.

Sec. Lts., Spec. Res., to be temp. Lts. whilst serving with R.F.C.:—A. L. M. Shepherd, K.R. Rif. C., G. Philippi, 1st Dns., F. C. Dixon, Dorset R., Oct. 1st.

The following Sec. Lts. (on prob.), Spec. Res., are confirmed in their rank, and to be temp. Lts. whilst serving with R.F.C.:—G. J. Read, N. Staff. R.; H. F. Champion, Rif. Brig.; R. J. Bevington, R.F.A.; R. E. Meek, Wilts. R., Oct. 1st.

Temp. Sec. Lts. to be temp. Lts. whilst serving with R.F.C.:—C. E. Foggia, W. G. D. Turner, E. H. Hall, F. Sharpe, Notts and Derby R.; H. A. Pearson, R.A.; R. J. G. Temple, R.G.A., Oct. 1st.

E. L. Mann to be temp. Hon. Lt. (without pay and allowances) whilst empd. as an Asst. Insp. Aeronautical Dept., Nov. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—P. A. Barron, H. Lloyd, L. M. Barlow, N. Martin to be Sec. Lt., Oct. 23rd. To be Sec. Lts. (on prob.):—W. G. Peck, Oct. 14th. G. Dennison, Oct. 15th.

TERRITORIAL FORCE.—YEOMANRY.—LINCOLN.—Sec. Lt. (temp. Lt.) H. E. Read is secd. for duty with the R.F.C., Oct. 17th.

MONTGOMERY.—Sec. Lt. E. W. Capper is granted the temp. rank of Lt. while serving with the R.F.C., Oct. 1st.

NOTTS (SHERWOOD RANG.).—Sec. Lt. W. A. Porkess is granted the temp. rank of Lt. while serving with the R.F.C., Oct. 1st.

INFANTRY.—R. WARWICK RECT.—Sec. Lt. W. D. South is granted temp. rank of Lt. whilst serving with the R.F.C., Oct. 1st.

GLOUC. R.—Sec. Lt. B. K. D. Robertson is granted temp. rank of Lt. whilst serving with the R.F.C., Oct. 1st.

R. HIGHRS.—Sec. Lt. D. S. Turnbull is granted the temp. rank of Lt. whilst serving with the R.F.C., Oct. 1st, 1916.

NORTHN. R.—Sec. Lt. G. H. Lewis is granted the temp. rank of Lt. while serving with the R.F.C., Oct. 1st.

BEDFORD R.—Lt. J. M. J. C. J. I. Rock is secd. for duty with the R.F.C., Oct. 21st.

WORCESTER M.—Sec. Lt. R. S. Lucy is granted the temp. rank of Lt. whilst serving with the R.F.C., May 1st.

HIGHLAND L.I.—Sec. Lt. (temp. Lt.) G. T. Willcox is secd. for duty with the R.F.C., Oct. 15th.

HEREFORD R.—Sec. Lt. (temp. Lt.) P. S. Jackson-Taylor is secd. for duty with the R.F.C., Oct. 14th.

Lt. F. C. Barrell is secd. for duty with the R.F.C., Oct. 18th.

CHESHIRE R.—Sec. Lt. S. Collier is secd. for duty with the R.F.C., Oct. 14th.

* * *

From the "London Gazette" Supplement, Nov. 2nd, 1916.

WAR OFFICE, NOV. 2ND.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flt. Comdrs.—From Flying Officers, and to be temp. Capts. whilst so empd.; Sec. Lt. (temp. Lt.) M. Henderson, D.S.O., Sea. Highrs., T.F., April 1st. Sec. Lt. T. Davidson, Cam'n Highrs., T.F., Oct. 16th. Capt. H. W. von Poellnitz, Linc. R., from a Flying Officer, Oct. 17th.

Flying Officers.—Sec. Lt. A. E. McKay, Spec. Res., June 19th. Temp. Sec. Lt. H. C. Peirce, R. W. Kent R., and to be transfd. to Gen. List, Sept. 28th. Lt. S. Guillon, Canadian Gen. List, Oct. 13th. Sec. Lt. (temp. Lt.) J. P. D. MacLagan, R. Scots, T.F.; Sec. Lt. L. M. Barlow, Spec. Res., Oct. 14th. Sec. Lt. (temp. Capt.) R. G. H. Pixley, Lond. Brig., R.F.A., T.F., Oct. 15th. Lt. M. D. G. Scott, N. Lan. R., Spec. Res., from a Flying Officer (Observer), with seny, from May 21st. Temp. Sec. Lt. C. C. Cheate, York and Lanc. R., and to be transfd. to Gen. List, Oct. 16th.

Equipment Officer, 1st Cl.—Qrmr. and Hon. Lt. W. Thomas, R.F.C., from an Equipment Officer, 3rd Cl., and to be temp. Capt. whilst so empd., Sept. 1st.

Equipment Officer, 3rd Cl.—Sec. Lt. (temp. Lt.) H. Maccoy, Lond. R., T.F., Oct. 19th.

Adjut.—Sec. Lt. D. G. Nairn, Highland Divn. Train, A.S.C., T.F., and to be temp. Lt. whilst so empd., vice Lt. (temp. Capt.) R. H. Jerman, R. W. Fus., Aug. 28th.

MEMORANDA.—Sec. Lt. E. E. Robb, R.F.C., S.R., to be temp. Capt. (without pay and allowances of that rank) while serving with Home Defence Wing, Nov. 3rd.

Sgt. S. F. Cody, from R.F.C., to be temp. Sec. Lt. for duty with Mil. Wing of that Corps, Oct. 10th.

Actg. Cpl. F. R. H. Logan, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with Mil. Wing of that Corps, Oct. 11th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The notification in "Gazette" of Aug. 17th regarding the appt. of Sec. Lt. A. E. Blackmore is cancelled. Sec. Lts. (on prob.) confirmed in rank:—C. M. W. Park, J. E. R. Avery, A. E. Blackmore to be Sec. Lt. (on prob.), Aug. 29th.

TERRITORIAL FORCE.—YEOMANRY.—SCO. HORSE.—Sec. Lt. S. S. B. Purves is secd. for duty with the R.F.C., Oct. 21st.

R.G.A.—ESSEX AND SUFF.—Sec. Lt. M. W. Turner is secd. for duty with R.F.C., Oct. 15th.

INFANTRY.—DURH. L.I.—Lt. P. W. Murray is secd. for duty with the R.F.C., Oct. 20th.

* * *

From the "London Gazette," Nov. 3rd, 1916.

ADMIRALTY, OCT. 28TH.

R.M.—The temp. commn. of Maj. P. W. North is terminated on his transfer to R.N.A.S., June 11th, 1915.

WAR OFFICE, NOV. 3RD.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flt. Comdr.—Lt. C. A. Ridley, M.C., R. Fus., from a Flying Officer, and to be temp. Capt. whilst so empd., Oct. 20th.

Flying Officers.—Sec. Lt. (temp. Lt.) E. R. Farmer, Notts Yeo., T.F., July 20th. Temp. Sec. Lt. S. F. Cody, Gen. List, Oct. 10th. Temp. Sec. Lt. C. C. Marsden, Gen. List; Sec. Lt. (on prob.) H. B. Begg, Spec. Res., Oct. 16th. Temp. Sec. Lt. (temp. Lt.) J. H. Thomas, Manch. R.; temp. Sec. Lt. (on prob.) W. D. Patrick, Gen. List, Oct. 17th. Temp. Lt. D. M. Macdonald, Gen. List, Oct. 18th. Sec. Lt. P. B. Boyd, Gord. Highrs., and to be secd., Oct. 19th.

Flying Officers (Observers).—Sec. Lt. P. S. Jackson-Taylor,

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Hereford R., T.F.; Sec. Lt. G. C. T. Hadrill, A.S.C., and to be sec'd., Oct. 14th. Temp. Sec. Lt. J. A. Gerges, York and Lanc. R., and to be transf'd. to Gen. List; temp. Sec. Lt. T. K. Twist, Durh. L.I., and to be transf'd. to Gen. List; Sec. Lt. A. Douglas, R.F.A., Spec. Res.; temp. Sec. Lt. H. Jackson, R.A., and to be transf'd. to Gen. List, Oct. 16th. Capt. H. G. Fisk, R.F.A., T.F.; temp. Sec. Lt. O. D. Norwood, A.S.C., and to be transf'd. to Gen. List, Oct. 20th.

Equipment Officers, 3rd Cl.—Temp. Lt. H. Fernihough, Welsh R., and to be transf'd. to Gen. List; Sec. Lt. W. D. South, R. War. R., T.F.; temp. Sec. Lt. M. L. Horn, Gen. List; Sec. Lt. J. E. R. Avery, Spec. Res.; temp. Sec. Lt. W. T. H. Hocking, Gen. List; Sec. Lt. C. M. W. Park, Spec. Res., Aug. 1st. Temp. Sec. Lt. C. E. Morgan, Gen. List., Oct. 4th. Sec. Lt. (temp. Lt.) C. A. H. Mason, E. Surr. R., T.F.; Sec. Lt. (on prob.) J. Paradise, Spec. Res., Oct. 18th.

TERRITORIAL FORCE.—R.F.A.—NORTHUMBRIAN BDES.—Sec. Lt. (temp. Lt.) H. E. Vaughan-Stephens is sec'd. for duty with the Anti-Aircraft Section, March 4th.

NOTTS AND DERBY R.—Sec. Lt. (temp. Lt.) J. R. H. Whiston (Prov. Bn.) is now sec'd. for duty with the R.F.C., Oct. 18th.

* * *

From the "London Gazette" Supplement, Nov. 4th, 1916.

WAR OFFICE, Nov. 4th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Squadron Comdr.—Lt. (temp. Capt.) F. W. Goodden, Spec. Res., from a Flt. Comdr., and to be temp. Maj. whilst so empld., Oct. 23rd, 1916.

Flt. Comdr.—The appt. of temp. Capt. D. K. Johnstone, Gen. List, notified in the "Gazette" of Aug. 19th, 1916, is antedated to April 1st, 1916.

Flying Officers.—Temp. Sec. Lt. D. S. Allan, Gen. List, Oct. 8th, 1916. Sec. Lt. (temp. Lt.) H. E. Read, Linc. Yeo., T.F., temp. Sec. Lt. H. E. Arnold, Gen. List, and Sec. Lt. M. R. Halliwell, Spec. Res., Oct. 17th, 1916. Lt. F. C. Barrell, L'pool R., T.F., Oct. 18th, 1916.

Equipment Officers, 3rd Cl. (substituted for the notifications in the "Gazette" of Nov. 1st, 1916).—Sec. Lt. A. C. Blackmore, Spec. Res., July 12th, 1916. Lt. O. L. Preston, Notts and Derby R., T.F., from a Flying Officer (Observer), July 17th, 1916. Temp. Sec. Lt. J. M. Macaulay, Gen. List, Aug. 1st, 1916.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) confirmed in their rank:—H. B. Begg, M. R. Halliwell, and J. Paradise.

To be Sec. Lts. (on prob.), Oct. 6th, 1916:—Alexander L. W. R. Henry-Waetjen, and Jared D. E. Troop.

The appt. of Sec. Lt. (on prob.) Henry R. Williamson, notified in the "Gazette" of Oct. 17th, 1916, is cancelled.

* * *

From the "London Gazette" Supplement, Nov. 6th, 1916.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Special Appts.—Graded as Park Comdrs.—From Equipment Officers:—Capt. (temp. Maj.) J. T. C. Moore-Brabazon, Spec. Res., and to retain his temp. rank whilst so empld.; Capt. (temp. Maj.) T. V. Smith, M.C., Spec. Res., and to retain his temp. rank whilst so empld.; Lt. (temp. Capt.) S. A. Currin, Spec. Res., and to be temp. Maj. whilst so empld., Oct. 13th.

Flt. Comdrs.—From Flying Officers, and to be temp. Capts. whilst so empld.:—Sec. Lt. H. Spanner, Spec. Res., Oct. 20th. Sec. Lt. J. C. McMillan, R. Sc. Fus., Oct. 22nd.

Flying Officers.—Sec. Lt. A. O. B. Traill, W. Rid. R., and to be sec'd., Oct. 11th. Sec. Lt. D. A. R. Chapman, Gen. List, Oct. 12th. Sec. Lt. M. W. Turner, Essex and Suff. R.G.A., T.F.; Sec. Lt. (temp. Lt.) G. T. Willcox, High. L.I., T.F.; temp. Sec. Lt. H. W. H. Marshall, W. York R., and to be transf'd. to Gen. List, Oct. 15th. Sec. Lt. A. C. S. Irwin, R. Ir. Rif., and to be sec'd., Oct. 16th. Sec. Lt. (on prob.) G. S. Deane, Spec. Res., Oct. 18th. Temp. Sec. Lt. H. G. C. Bowden, Gen. List; Sec. Lt. S. Willmetts, Spec. Res.; temp. Lt. F. F. Wessel, R. Fus., and to be transf'd. to Gen. List; Sec. Lt. P. L. Plant, R. Ir. F., Spec. Res., and to be sec'd.; Sec. Lt. R. B. Bourne, Spec. Res.; temp. Sec. Lt. C. A. Bourne, Gen. List, from a Flying Officer (Observer), with seny. from Oct. 25th, 1915. Temp. Sec. Lt. C. V. de B. Rogers, Gen. List; Sec. Lt. R. W. Reid, Spec. Res., Oct. 19th. Sec. Lt. (temp. Lt.) P. W. Murray, Durh. L.I., T.F.; temp. Lt. J. Parry, A.S.C., and to be transf'd. to Gen. List; Sec. Lt. (temp. Lt.) A. J. C. E. Philippo, A.S.C., and to be sec'd.; Sec. Lt. A. V. H. Gompertz, Spec. Res.; temp. Lt. F. H. Turner, M.C., Glouc. R., and to be transf'd. to Gen. List, Oct. 20th. Sec. Lt. C. E. de Bernigny, Spec. Res.; Lt. J. M. J. C. I. Rock, Bedf. R., T.F.; Sec. Lt. A. P. Hartley, Ches. R., T.F.; Sec. Lt. S. S. B. Purves, Sco. Horse Yeo., T.F.; Sec. Lt. V. H. Adams, Spec. Res., Oct. 21st. Surname of Sec. Lt. (on prob.) A. R. M. Scrase-Dickins is as now described, and not as in the "Gazette" of Oct. 23rd.

Flying Officer (Observer).—Temp. Sec. Lt. G. N. Dennis, E. York R., Oct. 22nd.

Balloon Officer.—Sec. Lt. J. Baxter, Gen. List, Oct. 12th.

Equipment Officers, 2nd Cl.—From Asst. Equipment Officers, and to be temp. Lts. whilst so empld.:—Sec. Lt. J. D. Troup,

Spec. Res., Sept. 26th. Sec. Lt. J. C. Forsyth, Spec. Res., Oct. 17th.

Special Appt.—Graded as an Equipment Officer, 2nd Cl.—Temp. Sec. Lt. T. F. G. Strubell, Gen. List, from an Equipment Officer, 3rd Cl., and to be temp. Lt. whilst so empld., Sept. 26th.

Equipment Officers, 3rd Cl.—Sec. Lts., Gen. List:—H. C. Williamson, June 22nd. W. Millett, June 23rd. L. Auken, W. H. Clover, July 1st. F. Pratt, Oct. 1st. J. Rigby, C. L. Archbold, O. W. Latimer, J. Rylands, Oct. 12th. J. P. Angell, Oct. 10th. The appts. of the following, notified in "Gazette" of Sept. 27th, are antedated to Aug. 1st:—Sec. Lts., Spec. Res.—H. H. W. Vowden, H. E. L. Pilbrow, G. A. Lawlor, E. G. Herbert, L. Stones.

MEMORANDA.—Cadets to be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—D. C. Sutherland, F. Briggs, H. McG. Wood, D. H. Etheridge, A. Howard, E. C. Frisby, Nov. 5th.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Sgt. R. Rainford, L.-Cpl. A. Hodgkins, Pte. R. Leake, Sgt. P. R. Garner, Sgt.-Drmr. G. J. Enguell, L.-Cpl. E. E. Beaumont, Nov. 5th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—S. Willmetts, A. V. H. Gompertz, C. E. de Bernigny, R. B. Bourne, R. W. Reid, V. H. Adams, to be Sec. Lts. (on prob.):—H. F. Wilkinson, J. D. Smith, Oct. 16th. A. R. Mitchell, Nov. 5th. E. P. Proud, W. S. Farley, C. J. S. Holden, Nov. 6th.

TERRITORIAL FORCE.—INFANTRY.—R. WELSH FUS.—Sec. Lt. (temp. Lt.) J. B. Mendham (Prov. Bn.) is now sec'd. for duty with R.F.C., Oct. 26th.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Nov. 4th, 1916.

The following officer had the honour of being received by the King, when His Majesty conferred upon him the Distinguished Service Order:—

Flt. Comdr. KENNETH SAVORY, R.N.A.S.

The King then conferred the Military Cross upon the following officers:—

Lt. CLIFFORD WHITLEY, Sussex Regt., attached F.F.C.

Sec. Lt. CLACY MAY, R.F.C.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Oct. 31st.—Squadron Comdr.: I. T. Courtney, apptd. Act. Wing Comdr., seny. Oct. 1st.

Temp. commissions as Lts. (R.N.V.R.) have been granted to H. Howard and S. C. Perryman, seny. Oct. 30th.

Nov. 4th.—R.N.R.—P. O. Mech. (R.N.A.S.).—C. W. Gilbert, granted a temp. commission as Engr. Sub-Lt., seny. Oct. 6th.

The undermentioned have been entered as proby. flight officers for temp. service, and appointed to the "President," additional, for R.N.A.S., all to date Nov. 5th: M. G. Woodhouse, A. H. Garland, R. W. Gant, N. A. W. Owen, R. B. R. Ashworth, G. A. Brown, and G. H. Willows.

Nov. 4th.—Comdr.: R. S. Roy, to "Daedalus," addl., for R.N.A.S., Nov. 3rd.

Proby. Flt. Sub-Lt. (temp.): H. O. Merriman, granted a temp. commission as Sub-Lt. (R.N.V.R.), seny. Nov. 3rd, and apptd. to "President," for R.N.A.S. (appt. as Proby. Flt. Sub-Lt., temp. terminated).

Sub-Lts. (R.N.V.R., temp.): R. K. Marwood, and N. G. Snelling, promoted to Lts. (temp.), seny. Nov. 1st.

The following have been entered as Proby. Flt. Officers (temp.), and apptd. to "President," for R.N.A.S.: F. C. Cressman, seny. Oct. 16th; J. A. E. Vowles, A. V. Evans, F. Stanier, and H. W. Lees, all seny. Nov. 12th.

Nov. 7th.—The following have been entered as Proby. Flt. Officers (temp.), seny. Nov. 12th:—H. T. Pepper, J. P. Barnes, P. W. Pearkes, P. G. Stokes-Rees, R. J. Stallard, A. C. Snow, E. A. M. Waterton, and J. S. A. Ferguson.

Temp. commissions (R.N.V.R.) have been granted to the following, seny. Nov. 4th:—Lts.—A. E. Penn and L. H. Pritchard. Sub-Lts.—J. Kelly and J. Bishop.

THE CASUALTY LIST.

Reported Nov. 4th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED NOT MISSING.—Chadwick, Flt. Sub-Lt. Arnold J., R.N.

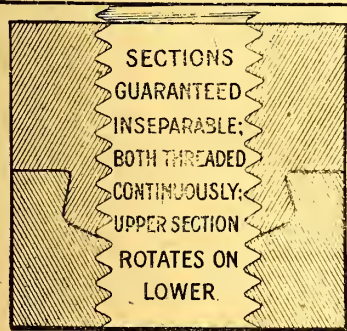
"Les Nouvelles," of Maastricht, states that pilot Flt. Sub-Lt. Arnold Chadwick, who took part in the raid of Oct. 2nd on the Zeppelin hangars at Brussels, has arrived in Holland. After the raid he was compelled to land owing to a motor defect at seven o'clock in the morning in the neighbourhood of Tirlemont. He wanted to set fire to his machine, but had no matches, and had to take to flight when a motor car full of Germans came up. He donned a peasant's cap and blouse, and succeeded in reaching

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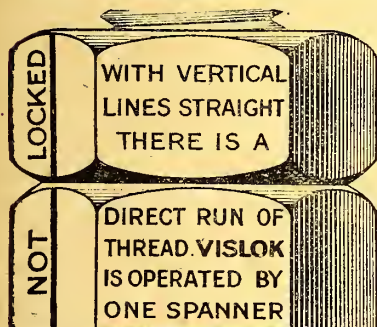
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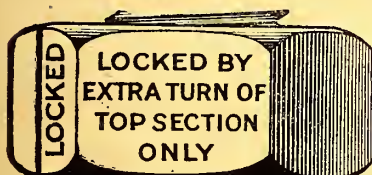


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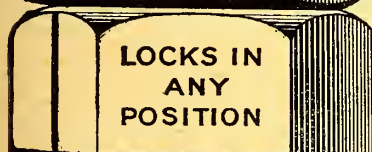
USED AS A SINGLE ORDINARY NUT



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does not damage the Bolt threads nor bruise its own threads. Will last as long as an ordinary nut. No previous preparation of bolt required. Does not require special bolts. Can be repeatedly re-used.



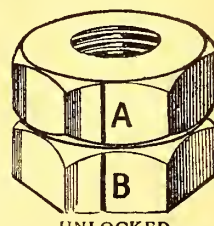
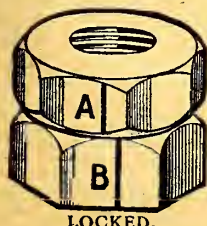
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a neighbouring town, where he hid for several weeks. After a series of adventures he managed to reach the Dutch frontier.

Ft. Lt. Cradwick was officially notified as missing and later as not missing, so one assumes that he has returned.

MILITARY.

G.H.Q. COMMUNIQUÉS.

Nov. 1st, 9.12 p.m.—Yesterday our aircraft did some useful work in reconnaissance and in bombing enemy batteries. One hostile machine was driven down in a damaged condition, and one of ours is missing.

Nov. 2nd, 9.10 p.m.—A number of enemy batteries were bombed yesterday by our aircraft. One hostile machine was driven down damaged and one of our own machines is missing.

Nov. 3rd, 9.32 p.m.—Yesterday, in the course of combats in the air two enemy machines were destroyed.

Nov. 4th, 9.12 p.m.—Yesterday our aircraft successfully bombed many enemy billets. One of our machines attacked and destroyed a hostile aeroplane, but was in turn attacked and fell inside the enemy lines. Four others have failed to return. The strong westerly winds of the past three weeks have made our aerial operations difficult, since they drift our machines far over the enemy front, and compel them to return slowly against a head wind.

Nov. 6th, 9.37 p.m.—Yesterday, in spite of the gale, our aircraft did useful work in observing for the artillery. One machine was in the air for over three hours.

A telegraph dispatch, dated Nov. 1st, 6.22 p.m., giving a summary of recent operations, has been received from General Headquarters in France. It says:—

Towards the end of the month the enemy's artillery became more active, and enemy aeroplanes were more in evidence. This increased activity has been satisfactorily dealt with by our own guns and aircraft.

* * *

WAR OFFICE COMMUNIQUÉS.

OCT. 30th.—The General Officer Commanding British Forces in Greece reports:—Our naval aeroplanes dropped bombs on the railway bridge at Simsirli (east of Drama), and damaged it.

NOV. 2nd.—The General Officer Commanding the British Army at Salonika reports:—Doiran Front.—Janes Station was bombed yesterday by hostile aircraft, but no damage was incurred.

Nov. 3rd.—The General Officer Commanding British Forces in Mesopotamia reports:—On Nov. 1st a hostile aeroplane was bombed and destroyed by one of our machines.

Nov. 3rd.—The General Officer Commanding British Forces in Greece reports:—Bursuk has been successfully bombed by our aviators.

* * *

THE CASUALTY LIST.

Reported Nov. 1st.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER OF WAR IN GERMAN HANDS.—Salmond, Capt. H. G., R.F.C.

PRISONER OF WAR IN GERMAN HANDS.—Organ, Sec. Lt. A. F., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMAN HANDS.—Smith, Sec. Lt. C., R.F.C.

DIED OF WOUNDS.—R.F.C.—Rolfe, 16186 2nd Cl. Air Mech. H. H. R. (Tring).

Reported Nov. 2nd.

MISSING.—Bolitho, Sec. Lt. G. R., Devon R., attd. R.F.C.

Collen, Sec. Lt. J., R. Innis Fus., attd. R.F.C.

Fisher, Sec. Lt. A. J., R.F.C.

Fraser, Sec. Lt. W., R.F.C.

Williams, Sec. Lt. S. N., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMAN HANDS.—Hunt, Sec. Lt. K. F., Yeomanry and R.F.C.

Reported Nov. 3rd.

KILLED.—Jervis, Lt. J. C., R.F.C.

WOUNDED.—Smith, Sec. Lt. J. S., N. Staffs Regt. and R.F.C.

MISSING.—Carlyle, Sec. Lt. W. M., R.F.C.

Palfreyman, Sec. Lt. G. A., E. Kent Regt., attd. R.F.C.

Parsons, Sec. Lt. F. G., R.F.C.

Reported Nov. 4th.

WOUNDED.—Bayley, Sec. Lt. V., Liverpool Regt., attd. R.F.C.

Crawford, Sec. Lt. W. C., Machine Gun Corps and R.F.C.

MISSING.—Mitchell, Sec. Lt. H. B. O., M.C., R. Inniskilling Fus., attd. R.F.C.

Reported Nov. 6th

KILLED.—Niven, Sec. Lt. W. A. M., R.F.C.

Fawknor, Sec. Lt. L. C., R.F.C.

Haywood, Lt. S., E. Lanc. R., attd. R.F.C.

King-Harman, Capt. L. H., R.H.A., attd. R.F.C.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Simpson, Sec. Lt. J. A., R.F.C.

Hann, Sec. Lt. C. C., R.F.C.

Marchant, Sec. Lt. F. G. W., R.W. Kent R. and R.F.C.

MISSING.—Heppell, Sec. Lt. P. F., R.F.A. and R.F.C.

Sharpe, Sec. Lt. M., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS OF WAR IN GERMAN HANDS.—Carter, Sec. Lieut. R. N., Dorset R., attd. R.F.C.

Helder, Lt. L. B., R. Fus., attd. R.F.C.

Money, Lt. R. R. E. Yorks R., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER OF WAR IN GERMAN HANDS.—Macfie, Sec. Lt. J. D. A., Black Watch, attd. R.F.C.

PREVIOUSLY REPORTED PRISONER OF WAR, NOW REPORTED EXCHANGED PRISONER OF WAR AND TRANSFERRED TO INDIA.—R.F.C.—Hogg, 1414 Air Mech. J. (Kinglassie, Fife).

Reported Nov. 7th.

WOUNDED.—R.F.C.—Cockerell, 1491 Sgt. S. (Hounslow); Mole, 5077 2nd Cl. Air Mech. J. L. (Liscard); Kettle, 10024 2nd Cl. Air Mech. F. W. (Islington, N.).

* * *

The following telegrams have been received from Mr. Edmund Candler, the representative of the British Press with the Expeditionary Force in Mesopotamia:—

Via BASRA, OCT. 26th.

Yesterday morning one of our aviators returning from a reconnaissance attacked a party of enemy irregular cavalry. After dropping bombs among them, he descended to 800 ft., firing his machine-gun into them, and killing many. In the evening five of our machines raided a cavalry camp by Shattlhai, dropped bombs, and again brought the machine-gun into action, causing considerable loss and panic, and returning untouched. Machine-gun fire employed against troops from an aeroplane is a new factor on this front. Enemy machines have been little in evidence for some weeks until this morning, when two hostile aeroplanes dropped bombs in the neighbourhood of our camp. No damage was done.

OCT. 27th.

A small affair which took place this morning affords a striking instance of aeroplanes working in co-operation with cavalry. At 8.30 a.m. it was reported that mounted enemy irregulars had driven off our camels on the left bank of the river, and were proceeding north-west. Two aeroplanes were sent out with machine-guns to attack and drive off the raiders. Our aviators soon passed over scattered bodies of mounted men who were taking cover in nullahs and firing at the machines. These were driven out by machine-gun fire from the aeroplanes, and breaking into small groups made for the hills. Several were hit, and three or four killed. During the action our machines flew very low, descending at times to within 20 feet of the ground. After dispersing the body our aviators pursued the raided camels, which were seen being driven towards the hills by troops of irregular cavalry. Fire was opened from the aeroplanes, and the escort immediately abandoned the camels, retiring towards the mountains. A troop of our cavalry coming up recaptured the camels. The machines and cavalry continued to chase the raiders, inflicting further casualties.

* * *

The following is taken from the letter of an officer serving in Mesopotamia:—

I am now at Es Sinn within sight of the famous Dujailah Redoubt.

You remember I told you some time ago that Fritz and his Fokker had command of the air out here. Now *nous avons changé tout cela*. Fritz's famous Fokker was put down some weeks ago, and, we hope, totally destroyed. Three of our new machines got after him, but one of the planes did most of the fighting and finally forced him down on to the opposite bank, which the Turks hold. After the fight there was a fine bit of evacuation. One of the aviators got a bullet in his leg, and another evacuated him straight down to Amara by aeroplane, doing the journey in less than an hour. Had he gone down in the ordinary way he would probably have had to wait three days for a boat and taken about the same time to get down river.

* * *

The following amended rates of daily pay of officers of the R.F.C. (Military Wing) are published in an Army Order issued last week.

Wing Commander, 38s.; Depot Commander, 30s.; Squadron Commander, 25s., with 8s. flying pay; Park Commander, 25s.; Flight Commander on appointment, 17s. (increasing by 2s. a day for each year of service to 23s.), with 8s. flying pay; Flying Officer on appointment, 12s. (increasing by 1s. a day for each year of service to 16s.), with 8s. flying pay; Adjutant,* 20s.; Quartermaster as laid down in Articles 238-240, with extra pay of 2s. a day; Equipment Officer, 1st Class, 24s. 6d.; 2nd Class, 18s.; 3rd Class, pay of a Flying Officer or Quartermaster, and flying pay of 5s. for each day of ascent; Medical Officer, pay and allowances of his rank, and, if required to fly, such additional emoluments as the Army Council may decide.

* An Adjutant appointed before April 1st, 1916, will remain in receipt of the rate of pay laid down in the Warrant of March 26th, 1915.

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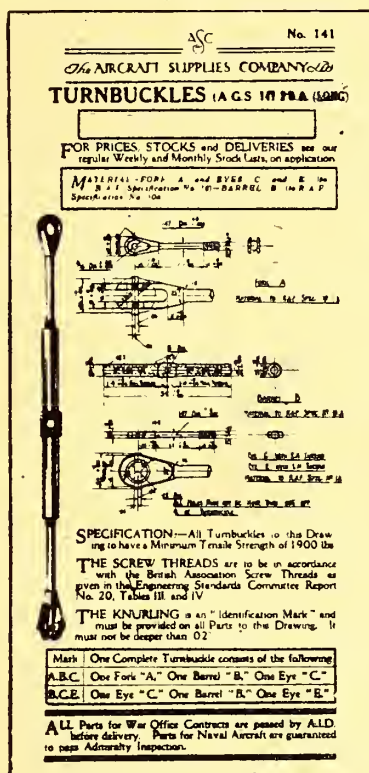


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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

A promotion of interest to early aviators is notified in the "Gazette" of Nov. 4th, in which Capt. F. W. Goodden is promoted to temp. Major. Mr. Goodden has long been connected with aeronautics, having commenced his aerial career as a balloonist and parachute artiste. Later he was employed by Mr. E. T. Willows in his airship work, and he accompanied that pioneer in the first voyage ever made across the Channel by an airship. Afterwards he learned to fly at Hendon, and became an instructor on Caudrons, and later one of the Grahame-White exhibition pilots. After the death of Mr. Hamel, Mr. Etches, a Bournemouth photographer, who had been acting as advance agent for Mr. Hamel, bought the deceased aviator's Morane monoplane and engaged Mr. Goodden to fly it, and he soon became one of the most skilful of aerial acrobats.

After the outbreak of war interest in exhibition flying waned somewhat, and Mr. Goodden joined the Royal Aircraft Factory as a test pilot, and displayed the R.A.F. machines to great advantage. Some time afterwards he was appointed a second-lieutenant R.F.C.; for R.A.F. testers occasionally took machines to France and a uniform was necessary, although they were not called upon to do military duty. His skill in getting the best possible results out of R.A.F. products won deserved approbation from the Authorities, and his devotion to his arduous task has led to progressive and rapid promotion, as the "Gazette" shows.

In these days, when officers of the "Old Army" are so often left out in the cold, despite wounds, and the perils and discomforts which they have suffered on continuous active service, it is interesting to see that those in high places do not forget the men who have served them well at home, for, after all, one would think that it would be so much easier to overlook such home service than the work of those who have endured the hardships of actual campaigning. Mr. Goodden is to be congratulated on his success.

PERSONAL NOTICES.

DEATHS.

CREERY.—Killed in air fight on Oct. 20th, 1916, Cuthbert John, Sec. Lt., R.F.C., second son of Andrew McCreight Creery and Anna Creery (née Hulbert), of Vancouver, aged 21. Mr. Creery received his commission in Dec., 1915, and he was gazetted Flying Officer in April last.

* * *

HART.—Capt. Clifford John Hart, Worcestershire Regt., attached R.F.C., reported missing on August 9th, is now known to have been shot down on that date with his observer when on patrol duty.

He was the third son of the late Col. Wyndham Hart, V.D., and of Mrs. Wyndham Hart, of Fairfield, Streatham, and was 30 years of age. He was educated at Charterhouse, and on the outbreak of war obtained a commission in the Worcestershire Regt. He was wounded on May 18th, 1915, at Festubert, while serving

with the 2nd Battalion, and was mentioned in dispatches. He transferred to the R.F.C. in August, 1915, and in July last was granted special leave for meritorious work.

* * *

HAYWOOD.—On Oct. 26th, the result of an aeroplane accident on active service, Lt. Sydney Haywood, R.F.C., elder son of Charles and Ethel Haywood, "Greycroft," Accrington, aged 25.

* * *

JERVIS.—Lt. J. Cedric Jervis, R.F.C., who was killed on October 26th, aged 26, was the son of the Rev. J. Jervis, vicar of Snitterfield, Stratford-on-Avon. He was educated at King Edward's School, Birmingham, and was preparing for Holy Orders at the Scholæ Cancellarii, Lincoln, when the war broke out. He was one of four brothers who offered their services (one is now a prisoner in Turkey). He enlisted in the Royal Fusiliers (Public Schools Battalion), in which he obtained his commission and transferred to the R.F.C. His commanding officer writes:—"I have lost not only my best officer, but my best friend also; everyone in the squadron deeply mourns him."

* * *

KING-HARMAN.—Killed on active service, when flying, Capt. Lawrence Hope King-Harman, Royal Horse Artillery, attached R.F.C., the dear elder son of Sir Charles and Lady King-Harman, aged 27.

Capt. King-Harman was grandson of General Sir Robert Biddulph, G.C.B., G.C.M.G. Born in 1889, he was Woolwich. He obtained his commission in the Field Artillery in July, 1909, and joined his battery in India. In June, 1915, he was selected for the Royal Horse Artillery, and took part in the Mohmand Expedition on the North-West Frontier, for gallant conduct in which he was mentioned in dispatches. Early in this year he responded to a call for volunteers for training as observers in the R.F.C. in India, and proceeded to Mesopotamia in June last, attached to that branch of the Service. On arrival at the front he was placed in temporary command of a field battery, and rejoined the R.F.C. shortly before his death. He was killed in an accident while flying on Oct. 26th.

* * *

OSMASTON.—Sec. Lt. Robert Shirley Osmaston, M.C., R. Sussex Regt. and R.F.C., was the son of Mr. and Mrs. Francis P. Osmaston, of Stoneshill, Limsfield, and grandson of Mr. John Osmaston, late of Osmaston Manor, Derby. He was born in 1894, and educated at Earleywood Preparatory School, Ascot, and Winchester College (Kingsgate House), where he gained the gold medal for gymnastics in 1912, and was an excellent boxer. He had a short course of agricultural training after leaving Winchester, and when the war broke out enlisted as a private in the U.P.S. Brigade. In May, 1915, he obtained his commission in the R. Sussex Regt., and went to the front on Dec. 1st, 1915. Early this year he was an instructor of Lewis gun training, and later acting adjutant of his brigade, and was attached to Brigade



A Group of Australian Officers at the opening of the New South Wales Aviation School at Clarendon, Richmond, near Sydney. The Instructors, Mr. Stutt and Mr. Lang, are seen standing bareheaded in front of the school Curtiss.

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Headquarters learning staff work. In April he conducted a raid into the enemy trenches very successfully and without any casualties, and was shortly afterwards awarded the Military Cross. In July he transferred to the R.F.C., and served as observer till he was killed. His pilot wrote of him:—"As an observer he was absolutely ideal, being awfully quick in his manner of handling the guns."

* * *

SAINT.—Killed in action, on Sept. 15th, William Bell Saint, Sec. Lt., Royal Scots, attached to R.F.C., beloved younger son of H. B. and A. M. Saint, Seltorne, Monkseaton, aged 23.

Mr. Saint joined a public school battalion in Sept., 1914, and later obtained a commission in the Royal Scots. In January of this year he was attached to the R.F.C. as an observer, and he went to the front in May.

* * *

SIMPSON.—Intimation has been received of the death at the front on 23rd inst. of Sec. Lt. J. A. Simpson, R.F.C., as the result of wounds received in action on 21st inst. The son of Mr. J. Simpson, bank agent, Portree, Skye, Mr. Simpson was educated at Portree Public School and Aberdeen Grammar School, was dux and gold medallist of the modern side of the Grammar School, 1903.

Thereafter he received an appointment in the Royal Laboratory, Cape of Good Hope; graduated B.A. with honours Cape University. In 1911 he joined the staff of the Trigonometrical Survey Department, Federated Malay States.

In January, 1915, he returned to this country to join the forces, and obtained his commission in the Black Watch. In June last he was transferred to the R.F.C., proved an efficient and fearless aviator, and was on active service with that Corps until his death.

* * *

MARRIAGES.

MANSON — TALBOT.—The marriage arranged between Neville B. Manson, Lt., London Regt., attached R.F.C., and Miss Maud Talbot took place quietly on Nov. 1st at All Saints' parish church, Hove, at 2 p.m.

* * *

ORTON—SIMCOX.—On Oct. 31st, at Holy Trinity Church, Malvern, Capt. John Overton Cone Orton, Norfolk Regt. and R.F.C., eldest son of the late John Nicholas Colthurst Orton ("Charles Overton"), to Eveline Helen Simcox, second daughter of A. H. A. Simcox, Esq., I.C.S., Ahmedabad, India. Indian papers, please copy.

* * *

PAYN—SHEPHERD.—On Oct. 29th, at St. Saviour's, Denmark Park, by the Rev. Osmund R. M. Roxby, M.A., Lt. H. J. Payn, R.E. and R.F.C., to Evelyn Marguerite Shepherd, only daughter of the late Capt. A. W. Shepherd, of the Indian Ordnance, and Mrs. Shepherd, of 27, Grove Hill Road, Denmark Park, S.E. Indian papers, please copy.

* * *

RUTHVEN-STUART—GRANT DUFF AINSLIE.—On Nov. 1st, at Holy Trinity, Sloane Street, by the Archdeacon of Middlesex (rector of Chelsea), and the Rev. de Vere Lawrence, Capt. Alexander Ruthven-Stuart, Gordon Highlanders and R.F.C., younger son of the late Whitewright Stuart and Mrs.

Ruthven-Stuart, of 35, Sloane Gardens, to Stella Marion, eldest daughter of Mr. and Mrs. Julian Grant Duff Ainslie, of Old Mill House, Hellingly, and granddaughter of Mr. and Mrs. Ainslie, of Delgaty Castle, Aberdeenshire.

The bride was given away by her father. Miss Cynthia Juliet Grant Duff Ainslie (sister of the bride) and Miss Violet Cottell (cousin of the bridegroom) were the bridesmaids, and Miss Jean Grant Duff and Master Neil Grant Duff (cousins of the bride) carried her train. Mr. Richard Crewe was best man. Among those present were:—Georgina Lady Belhaven, the Hon. Mrs. Henry Bevan, the Hon. Mrs. Dyson-Laurie, the Hon. Mrs. Borrass Whiteside, the Hon. Mrs. Henry Maxwell, Mrs. Adrien Porter, Mrs. Brabazon Combe, Mr. and Mrs. Claude Hankey, the Hon. Lady Fremantle, the Hon. Mrs. Bernard Barrington, Lady Ward, Mrs. Millington Drake, Lady Nicholson, Mrs. Adrian Hope, Mrs. Hope Nicholson, Mrs. and Miss Huth Jackson, Lady Wilson, Mrs. Robert Arbuthnot, M. Grouitch, Sir Donald Mackenzie Wallace, and Sir William Porter.

ENGAGEMENTS.

DIXON—METFORD.—The marriage between Capt. H. Eric Dixon, Middlesex Regt. and R.F.C., and Miss Muriel A. Seymour Metford will take place quietly on Nov. 18th at 2.30 p.m. at Christ Church, Lancaster Gate, W.

* * *

HILTON—WOODIN.—An engagement is announced between Richard Hilton, Lt., R.G.A. and R.F.C., second son of Mr. J. E. Hilton, of Lambourne, Berks, and Phyllis Martha, eldest daughter of the Rev. and Mrs. Stanley H. Woodin, of Yarmouth Rectory, Isle of Wight.

* * *

ROGERS—ROTHERHAM.—The engagement is announced of Tanner M. Rogers, Lt., General List, attached Aeronautical Directorate, only son of Mr. and Mrs. Montagu Rogers, of Nansloe, Helston, Cornwall, and Rachel Frances, second daughter of Mr. and Mrs. Kevitt Rotherham, Great Gatehouse, Kenilworth.

* * *

BIRTH.

BERRINGTON.—On Oct. 28th, at 67, West Cromwell Road, S.W., the wife of Capt. J. S. D. Berrington, R.F.C., of a son.

FRANCE.

OFFICIAL COMMUNIQUÉS.

OCT. 31st (Army of the Orient).—British aircraft bombarded important enemy depots at Demir Hissar.

Nov. 1st.—On the Somme front yesterday two German aeroplanes were brought down by our pilots in the course of aerial fights.

Nov. 2nd.—In spite of the mist and the gales which have prevailed on the greater portion of the front, our chasing aeroplanes displayed activity yesterday.

On the Somme Adjutant Tarascon brought down his seventh enemy machine in the direction of Moislains. One of our three-seater aeroplanes brought down on the same day two German machines, which fell, one in the aerodrome of Metz-en-Couture (east of Le Transloy) and the other at Mont St. Quentin (north of Péronne).

In the region of Verdun a German machine was brought down



Officers of the R.F.C. on active service, with one of their small fighting biplanes.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

near Hogueville-en-Woevre by Adjudant Sayaret. This is the sixth machine brought down until now by this pilot.

One of our attacking squadrons attacked with machine-guns an infantry column of the enemy in the direction of Azbannes and some trains in the region of Conflans and Mangiennes (north of Verdun).

Finally in Alsace one of our pilots attacked four German machines and brought down one, which came crashing to the ground near Altkirch.

Nov. 3rd.—On the Somme front one of our three-seater aeroplanes, which was attacked in the region of Allaines (north of Péronne) by a group of six enemy machines, succeeded in bringing down one. One of our chasing squadrons which had come without delay to the help of our machine brought down a second enemy aeroplane and forced the others to take to flight.

A German machine, struck by a shell from our anti-aircraft guns, fell in the Forest of Nonnepruck, west of Mulhouse.

Nov. 4th.—During yesterday, on the Somme front, Lt. Heurtaux brought down his 11th enemy machine near Rocquigny, and Sergt. Sauvage his sixth. The latter fell near Mesnil-en-Arronaise.

A third German aeroplane was brought down in the district of Mesnil-Bruntel by one of our pilots.

One of our aeroplane squadrons bombarded the enemy encampments north of Monastir and near Prilep.

Nov. 6th (Army of the Orient).—British aeroplanes dropped several bombs on Bogdantsi (eight miles west of Doiran).

* * *

The following is from the "Matin" of Nov. 4th:—

"The British aviators accomplish the same mission as ours, shine with the same brilliancy and obtain also fine results. Yet there is a something indefinable which distinguishes them from our pilots.

"It is that our Allies wage war in the air as a sport rather than a military operation. For them it is a very exciting match which permits them to engage the abhorred enemy.

"The British, with perfect straightforwardness, give clearly in their official reports the number of their men who have not returned, but what acts of heroism are recorded every day in the annals of the Royal Flying Corps!"

The "Matin" concludes by quoting some deeds of heroism accomplished by British pilots—Allister, Mackintosh, Miller, Owen, Tudor, Boyd, Macdonald, Ball, Gerard, Dixon, Spain, Cope, Evans, MacLaren, Grant, Dalton, Hawey, etc.

* * *

According to the Amsterdam "Telegraaf" three French aviators have caused much damage with bombs near Courtrai. Their object was to interrupt railway communication between Courtrai and Menin.

* * *

According to the computation in the "Times" of Nov. 3rd, there was a sensible diminution last month, as compared with September, in the wastage of aircraft, whether British, French, or German, on the Western front. In September the number of aeroplanes destroyed or more or less damaged was well over 300. Last month the total was under 200. It is again impossible to state the exact number, for on three occasions at least British Headquarters has employed the general expression "many others" in relation to enemy machines driven down damaged, but those specifically stated to have been destroyed, shot or brought down, or forced to land amount to 171. Of these the British claim 39, the French 65, and the Germans 67.

British Headquarters has again to acknowledge a large loss of machines—42, as compared with 48 in September. As a set-off, 16 German aeroplanes were destroyed and at least 23 others were brought, shot, or driven down or forced to land in a damaged condition.

According to the daily official communiqués, from which all the figures are taken, the French brought down 51 and forced 14 others to land.

German Main Headquarters claim to have shot or brought down 62 Allied machines, either in air fights or by anti-aircraft guns, and to have "defeated" five, no indication being given of the fate of these others. Just over half the total of 67 are said to have been accounted for on two occasions—Oct. 21st, when "12 enemy aeroplanes were shot down, four of which fell behind our lines," and Oct. 23rd, when "22 enemy airmen were shot down in air fights and by anti-aircraft fire; 11 are lying behind our lines."

The worse weather of October, which diminished the amount of flying, and the shorter days, probably account for the lessening of the casualties.

GERMANY.

OFFICIAL COMMUNIQUÉS.

Nov. 4th.—Nine enemy aeroplanes were shot down in aerial fights and by our defensive fire.

Nov. 5th.—Constanza and Mangalia have been shelled from the sea. Some damage was caused at Constanza. The enemy's ships were driven off by the coast artillery and by aerial attacks.

According to the German papers the Kaiser has sent the late Captain Böelcke's father a telegram of condolence deploring the loss of "my bravest and most successful air officer."

A telegram from Berlin, received in Amsterdam on Oct. 30th, says that General von Bulow, who commands an army on the Western front, has published an obituary Army Order in honour of the aviator Capt. Böelcke. The Order, *inter alia*, states: "The bold aviator, Capt. Oswald Böelcke, fell unconquered on Oct. 28th owing to damage to his aeroplane."

* * *

The funeral service of Capt. Böelcke, the German aviator, according to the "Lokalanzeiger," took place at Cambrai Cathedral.

A flying officer afterwards delivered an oration at the railway station, in which he said that Capt. Böelcke was not brought down by an enemy bullet, as was at first reported, but during a fight between his squadron and some British airmen his machine was damaged in a collision with a German aeroplane.

Capt. Böelcke glided down spirally from 2,000 yards to 500 when his machine encountered a squall, and Capt. Böelcke was thrown headlong. He broke his skull, but no bullet was found in his body.

* * *

The "Lokalanzeiger" reports that the British officers at the internment camp at Osnabrück telegraphically asked for, and received, permission to lay a wreath on the coffin of the airman Capt. Böelcke, who was recently killed. On the satin band affixed to the wreath were inscribed in gold letters the words, "From the British officers who are prisoners of war at Osnabrück, Oct. 28th, 1916." A telegram from the British officers asking for permission to present the wreath described Capt. Böelcke as "a much admired and honoured enemy."

The "Kölnische Zeitung" publishes a letter by Capt. Böelcke, dated Oct. 24th, in which he says: "Here on the Somme is the real airman's El Dorado. When the weather is in any way fine the whole sky is full of Englishmen."

RUSSIA.

OFFICIAL COMMUNIQUÉ.

Nov. 3rd.—In the Caucasus on Nov. 1st two of our aviators bombarded the large Turkish encampments near Ishak-Majdany, north-west of Nurik, and near Tykolan, south-east of Cholik, and also two bridges on the Euphrates near Sagan.

AUSTRIA.

OFFICIAL COMMUNIQUÉ.

Nov. 1st.—Italian aviators dropped numerous bombs on Dutouleo, Sesana, and Miramar, without causing noteworthy damage. Capt. Schjenzel shot down a Caproni machine over Panzano Bay.

* * *

It is reported that during the evening of the 3rd inst. a naval aeroplane squadron dropped numerous bombs upon military objects at San Canziano, Monfalcone, and the Adria Works.

ITALY.

OFFICIAL COMMUNIQUÉS.

Oct. 30th.—As the result of an aerial fight on the Carso, an enemy aeroplane was brought down in our lines. One of the two aviators was dead; the other was taken prisoner.

ALBANIA.—On Oct. 29th hostile aircraft made a raid over the region of Klisura and the Lower Vojussa, dropping bombs without doing any damage.

SALONIKA.—One enemy aeroplane, while reconnoitring, was shot down near the railway station of Akindzali, on the line Doiran-Demir Hissar. A Bulgarian detachment went forward to recover the machine, but was dispersed by the fire from our artillery, which completely destroyed the aeroplane.

Nov. 1st.—Numerous air fights took place, in the course of which two enemy aeroplanes were driven down.

Fourteen Caproni battleplanes, escorted by Nieuport chasers, bombarded with marked success the railway stations of Nabresina (coast railway, Gulf of Trieste), Dottoglian, and Scopo (on the Gorizia-Trieste Railway), on the Carso. Our aviators were fired on by anti-aircraft guns and attacked by enemy aeroplanes, but all returned safely to our lines.

Enemy aircraft dropped bombs in the Cordevole Valley, in the Upper Vanoi Valley, near Tolmezzo, and on villages on the Lower Isonzo. A few people were wounded, but no material damage was done.

Nov. 2nd.—Hostile aircraft dropped bombs on several villages of the Lower Isonzo. The casualties at Pieris were one soldier and a captain and four men of the Red Cross.

A powerful squadron of 16 Caproni battleplanes, escorted by Nieuport machines, bombed enemy camps in the Frigido (Vipacco) Valley with two tons of explosives. In spite of heavy fire from hostile anti-aircraft batteries, all the machines returned in safety.

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TURKEY.

OFFICIAL COMMUNIQUE.

OCT. 30th.—A Turkish official report of Monday's date says: "Our volunteers, who on Oct. 27th carried out a surprise attack against the enemy's encampments at Sheik Said (Tigris front), and penetrated as far as the enemy aviation shed, returned safely after destroying a British aeroplane."

SERBIA.

The "Times" correspondent with the Serbian Army narrates the following incident in a message from Vrbeui, dated Oct. 29th:—During the thunderstorm this morning I witnessed an awe-inspiring incident. After a vivid flash of lightning the nearest of our balloons was seen to be on fire. It had been struck, and for perhaps two minutes the life of its occupant seemed in jeopardy. Then we saw a long funnel-shaped appendage emerge below his car and then drop down. There was a moment of tense anxiety as the object fell; then to our relief we saw it slowly open out until it attained its full umbrella shape. But now the wind wafted the parachute towards the enemy lines, and the observer clinging to it seemed in danger of capture. Fearing this he had the presence of mind to drop all his notes, but fortunately he alighted well within our lines with no other mishap than a sprained ankle. The loss of the balloon is of little consequence, as we have a reserve.

NORWAY.

A message from Christiania, Nov. 3rd.—A burning balloon, apparently one sent up from a warship for observation purposes, was seen on Tuesday morning from Livter (? Lier), 49 miles E.N.E. of Christiania. The balloon came from the sea, passed over the coast, and finally came down on a moor. It is supposed to be a British balloon and probably had a crew, but their fate is unknown. The remains of the balloon have been brought to Farsund (50 miles west of Christiansand).

HOLLAND.

The German Chargé d'Affaires has expressed the regret and apologies of the German Government at the action of the German airship in cruising over Dutch territory on Oct. 22nd. He states that according to information from Main Headquarters the Zeppelin in question was an army airship, which, owing to a defect in the motors and steering gear, was obliged to throw overboard two petrol-tanks. The commander, who had apparently quite lost his bearings, reported that the incident had occurred over Belgian territory. Main Headquarters, the Attaché added, would have offered its apologies sooner if it had known earlier that the airship had flown over Dutch territory.

MAURITIUS.

A message from Mauritius of Nov. 3rd states that the Council of Government and the sugar planters have combined to present one million rupees to the Imperial Government to provide either thirty battleplanes or as a contribution towards the cost of an airship.

CANADA.

It is reported from Ottawa that there is no truth in the rumour that Canada is to have an Air Minister of her own. One regrets it, for anything would be better than following England's example.

* * *

The "Morning Albertan," of Calgary, says:—

"Ottawa, Aug. 28th.—Important developments are anticipated from conferences now being held with Hon. J. D. Hazen and members of the Naval Service Department, and Lord Innes Kerr—[sic.—Ed.]—representing the Admiralty. The conferences have to do with the aviation questions and Canada's participation in that branch of the Service. At the close of to-day's conference, the Minister stated that important matters were under consideration, but that nothing could yet be made public."

U.S.A.

It was reported from Washington on Sept. 24th that George Rolls, an aeronaut of Spokane, fell 300 feet at the state fair, and was killed. He had been descending by a series of four parachutes. The second parachute failed to open, and he was dashed to the ground.

* * *

On Aug. 30th guests flew in hydro-aeroplanes to attend an aviation luncheon given by the Harlem board of trade to members of the New York Flying Club, said to be the first organisation of its kind in this country.

Guests who flew to the luncheon were Messrs. E. H. Kendrick, Atlantic City; Lawrence B. Sperry, inventor of the gyroscopic stabilizer, who came from Amityville, N.Y., and David McCullough, who flew from Port Washington, N.Y.

Rear Admiral Robert E. Peary, the principal speaker, suggested a plan for an aerial coast defence patrol, and advocated a

department of aeronautics, whose chief would have a seat in the Cabinet.

At the conclusion of the luncheon, Admiral Peary was taken to Governor's Island in Mr. McCullough's aeroplane.

* * *

It is reported that Messrs. E. K. Jacquith and George C. Thomas, who have been making passenger flights between Atlantic City and Philadelphia, are planning to start a regular flying-boat passenger service in the early part of 1917. It is proposed to make two round trips a day between Atlantic City and Philadelphia and longer flights as required.

The fares from Atlantic Coast Aeronautical Station are set forth as follows:—

	Return.		One Way.
	\$		\$
Norfolk	35.00	.....	20.00
Jamestown	50.00	.....	40.00
Richmond	200.00	.....	150.00
Washington	500.00	.....	375.00
Baltimore	500.00	.....	375.00
Philadelphia	750.00	.....	600.00
Atlantic City	800.00	.....	600.00
Asbury Park	1,000.00	.....	750.00
New York	1,250.00	.....	1,000.00

* * *

As the result of a quick rescue which occurred at Atlantic City the authorities there have recruited flying boats to the beach life guard service. The machines of Kenneth Jacquith and Beryl Kendrick, who have parking privileges on the upper beach, are now officially part of the life saving equipment.

Mr. Kendrick gave the use of his craft to the aid of Captain Albert Hall, of the beach control, to make a long run to save Edwin Welsler, a bather, who had drifted a quarter of a mile out to sea on an inflated tyre. [Is this a duration record or what?—Ed.]

* * *

The Aero Club of America announces the decision of the War Department, to train 1,000 aviators, only 114 of whom will be pukka army pilots. The remainder will be selected from the National Guard, who will be instructed at the Army flying schools, and certain civilians will be trained for an Aerial Reserve Corps. Details are not yet to hand.

CUBA.

It is reported that Capt. Augustin Parla, of the Cuban army, went to New York on August 28th, to make an investigation of military aviation with a view to establishing an aeronautical school for Cuban army officers. He will remain in the United States for six months.

Capt. Parla is himself an aviator of experience. It is reported that in 1913 he won the Glenn H. Curtiss medal by flying from Key West to Mariel, Cuba, a distance of 117 miles, without a guide or an accompanying vessel. He will remain in Buffalo for the greater part of his stay, taking up seaplane work. He was ordered to New York by Gen. José Martí, chief of staff of the Cuban army.

NEW ZEALAND.

From the Auckland "Weekly News," June 29th:—

"Beyond the announcement from the Army Council that Captain Herbert Ambrose Cooper was killed in action, June 21st, Mr. Justice Cooper has received no particulars of how his son met his death. Captain Cooper, who was 26 years of age, was born in Auckland, and educated at King's College, where he displayed marked ability. He always showed strong inclination for engineering, and after his college studies were finished he entered the Manawatu Railway Company's workshops, at Wellington, but was forced to relinquish the position owing to ill-health. With the object of following farming, Captain Cooper studied at Lincoln College, and later took up a holding at Waitetuna, near Raglan. Being desirous of taking up aviation, he went to England about four years ago, and succeeded in gaining an international certificate as aviator.

"He returned to New Zealand in March, 1914, but after remaining only a few weeks, again went to England, where he arrived towards the end of July, 1914. Captain Cooper joined the Royal Flying Corps on the morning war was declared, and from that date till the end of 1914 was engaged instructing at the headquarters flying camp, at Netherthorn—[Netheravon]—England. At the end of 1914 he went to the front, presumably the Western front, where, with occasional brief visits to London, he remained continuously on active service till the day of his death. Sergeant Cooper—as he then was—was promoted to a second-lieutenancy on the field, and at the end of last year was mentioned in Lord French's dispatch for gallant and distinguished conduct. Immediately afterwards he was promoted to a captaincy."

* * *

"Lieutenant George Vernon Aimer, a member of the Royal Flying Corps, who was accidentally killed whilst flying near London on June 22nd, was the eldest son of Mr. and Mrs. C. B. Aimer, of St. Stephen's Avenue, Parnell. He was born in Hokianga in 1886, and was educated in Auckland. For a time he was

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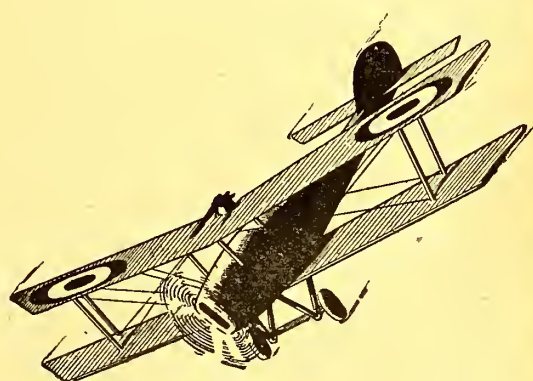
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

employed in the Government Forestry Department at Rotorua, subsequently taking a position in Fiji. Shortly after returning to Auckland in 1910, he entered the service of the Bank of New Zealand as correspondence clerk, a position he held for about five years. In August of last year he obtained extended leave of absence, and proceeded to England for health reasons. After a short time in hospital he offered his services to the War Office, but they were not accepted, owing to the state of his health. Lieutenant Aimer then studied aviation, and after qualifying for his pilot's certificate, was appointed an instructor at the London and Provincial Aviation Co.'s School.

"Later he again offered his services to the military authorities, and was given a commission in the Royal Flying Corps. Since then he had been through a course of instruction in Army work at Oxford, and it is believed was receiving further training at one of the War Office's aerodromes, when he met with the unfortunate accident which resulted in his death.

"When in Auckland the late lieutenant was very popular in athletic circles, and had at different times, over a period of eight years, been a member of the St. George's Rowing Club, part of which time he was captain. A brother, Trooper Alexander Goven Aimer, left for the front with the thirteenth reinforcements."

AUSTRALIA.

The military authorities state that all members of the A.I.F. who are accepted as candidates to attend the New South Wales Aviation School, will be granted leave to attend on the following conditions:—(1) Such leave will be without pay; (2) passing such a school gives no right to a commission; (3) with regard to the future employment of those who may qualify as aviators at the State Aviation School, successful candidates at the Commonwealth Flying School will receive preference in connection with all vacancies which occur in the Australian Flying Corps.

Those who qualify at the State Aviation School, however, and cannot be absorbed in the Australian Flying Corps, on application, may be granted a discharge from the A.I. Force, in order that they may offer their services to the War Office. Each application for discharge will be dealt with on its merits, and will not be considered as a right.

The following Australian officers were successful at the fourth course of aviation at the Central Flying School:—

Lt. R. C. Trout, 2nd A.L.H.; Capt. P. W. Stell, 38th Infantry; Capt. H. H. Storrer, A.G.A.; Lt. D. P. Flockart, 48th Infantry; Lt. J. Burke, 60th Infantry; Lt. V. A. Norvill, 82nd Infantry; Lt. K. W. Stronach, 86th Infantry; Lt. S. W. Addison, 93rd Infantry. Each has qualified for a pilot's certificate.

The following officers have been posted to the Australian Flying Corps Reserve:—

Capt. P. W. Stell, 38th Infantry; Capt. H. H. Storrer, A.G.A.; Lt. V. A. Norvill, 82nd Infantry; Lt. D. P. Flockart, 48th Infantry; Lt. R. C. Trout, 2nd A.L.H.; Lt. K. W. Stronach, 86th Infantry; Lt. S. W. Addison, 93rd Infantry; Lt. J. Burke, 60th Infantry.

Mr. W. G. T. Goodman (General Manager of the Adelaide Municipal Tramways Trust), who has been deputed by the South Australian Government to report upon the New South Wales aviation establishment, visited the aerodrome at Richmond, in the mother State, on Aug. 17th, and made a flight with Pilot-Instructor Stutt. Lt. Goodman and Mrs. Goodman also made flights.

New South Wales has contributed to the Patriotic Fund £2,687,823, in addition to £27,691 raised towards the provision of an Australian battleplane squadron.

From the Sydney "Morning Herald," July 13th:—

"Lieutenant F. E. Grimwade, son of Mr. E. Norton Grimwade, of Toorak, who early in the war enlisted in the Royal Flying Corps, was captured by the Germans in April. Writing from the Municipal Hospital at Courtrai, Belgium, on April 10th, to his parents, he stated:—"My observer and I were moved into this place about five days ago. On Saturday, April 1st, in the afternoon, I was on patrol duty near Ypres. We sighted a German machine, which we engaged at 3,000 feet. I found him faster and much more mobile than my old B.E., but honours were easy until he got his machine-gun on to my leg, just below the thigh. This settled things for us. Then my observer got hit. My thigh bone was smashed by several bullets and was pretty painful, and I felt I was going to faint. However, I struggled against this, and managed to land somehow behind the enemy's lines. The machine was a total wreck, but my observer was not killed in landing, so I felt rather pleased at this, as they almost invariably get finished off in an accident of this kind.

"Immediately after we crashed to earth I fainted. They took us on to a field dressing station, and then on to a sort of clearing hospital, then another place, and, finally, here, where we are very well cared for. I am getting along well, but expect will be on my back at least two months.

"My observer's name is Frost, and we have a nice bright room here. The German Flying Corps officers were most awfully good to us both. They paid us several visits, and asked if there was anything we wished for, and gave us books and cigarettes, etc. My leg, from ankle to hip, is now a solid mass of plaster of Paris, as hard as iron. I expect this will be on for at least another three weeks. I am well looked after, and getting on all right. It was bad luck I couldn't manage to land behind our lines, but as it was we ought both to have been killed. The Germans presented us each with a picture of the remains of our B.E., which will be most interesting after the war."

FROM DENMARK.

A further casualty list of the German flying services contains the following names:—

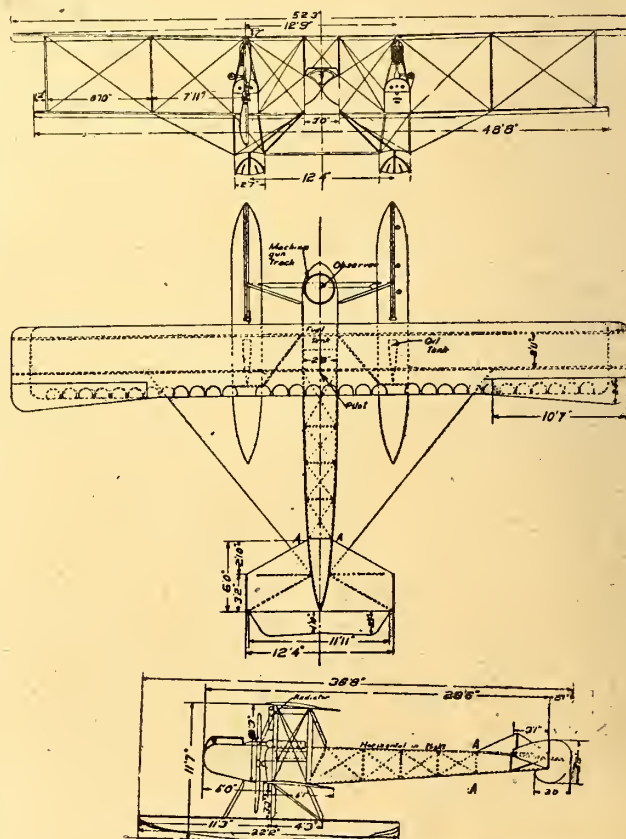
Ober-Lieut. Oskar Illing and his observer, Ober-Lieut. Hermann Craft, killed in aerial engagement; Ober-Lieut. Wilhelm von Ranke, killed; Lieut. Philipp Cherdron, killed; Observer, Lieut. of the Reserve, Zilling, killed; Sub-Officer Röder, killed; Naval aviator, Ober-Maat. Otto Wasserthal, killed; Lieut. of the Reserve Josef Schadel, accidentally killed during training as observer; Flight-Officer by Bavarian Battle-Plane Squadron, Willi Grossmann, killed in aerial fight; Lieut. of the Reserve Hans Kopp, killed; Lieut. of the Reserve Benno Berneis, killed in aerial fight; Captain Günther von Detten, killed in June; Lieut. of the Reserve Sedlmair, and his observer, Sub-Officer Gehring, killed; Sub-Officer Erich Finke, killed; Dragoner-Lieut. Kurt Lauffer, killed; Ober-Lieut. Friedrich Kraft, accidentally killed in flight over hostile lines; Vizefeldwebel by a Bavarian field airship section, Josef Schmidbauer, killed; Vizefeldwebel Hanz Kunze, killed in August.

On 5th August last, the second anniversary of the renewed issue of the iron cross, 10,000 persons had been awarded its first class, the newest weapon being highest represented, with the number of 484, by the Feldflieger troops and airship sections.

A GERMAN HYDRO-AEROPLANE.

A twin-motored German seaplane, captured some time ago in the North Sea, is the subject of an article by Jean Lagorgette in "L'Aérophile." Three drawings reproduced herewith give a very good idea of the general construction.

The two motors are 120-h.p. Mercedes, and the propellers are 8 ft. 7 in. in diameter. For such comparatively large power the machine is of small dimensions. The German tendency since the beginning of the war seems to be to reduce dimensions for the same power.



Sketch Diagram of a German Twin-Engine Seaplane.

The passenger sits forward and the armament consists of a machine gun, whose support slides on a circular tube surrounding the passenger, as can be seen from the drawing.

The main dimensions of the machine are:—

Total supporting area	560 sq. ft.
Span, upper wing	52 ft. 3 in.
Chord, upper wing	5 ft. 11 in.
Span, lower wing	48 ft. 8 in.
Chord, lower wing	5 ft. 11 in.
Gap	6 ft. 4 in.
Length overall	31 ft. 6 in.

Other dimensions are shown in the drawings. The machine was painted a very light blue, a useful colour in seagoing craft.

The total supporting surface of the wings is 560 sq. ft., which is very small for a seaplane of 240-h.p., and the wing section, of small camber, is that suitable for a fast machine, and it is slightly upturned at the trailing edge.

The wing spars are formed of glued laminations, an interesting and unusual method, which may indicate a shortage of properly seasoned timber of the right class. A slight dihedral is employed, but it is worthy of note that the wings are only raised beyond the fixed central section, as shown on page 886. It is difficult to say whether this is from aerodynamic considerations or merely for ease of construction. The extremities of the upper wing are raised about 7 inches and of the lower about 5.9 in., but the difference is only due to the shorter span of the latter.

In plan form the wings are rectangular, the ailerons only projecting. The ailerons, as in the Albatros, are warped, their trailing edges being gradually warped as they approach the extremities of the wing. The interplane struts are of wood, and steel cables are used for bracing.

The floats are connected to the body by several wooden struts and two steel tubes, all wires being dispensed with. They are somewhat lengthy, but the tail float is not fitted. Placed under the motors, their width between centres is 12 ft., which is little more than sufficient to give clearance to the two propellers.

The tail surfaces offer several peculiarities. The fixed stabiliser is of very large area; the elevator is in one piece, of considerable aspect ratio; the vertical fixed fin and the vertical rudder are duplicated at either side of the tail surfaces, and the rudder is balanced by a rounded surface placed forward of the hinge.

The tail surfaces present a peculiar appearance, but should give

a minimum interference between vertical and horizontal surfaces.

The fuselage is rectangular in form, and is divided into two parts just back of the pilot. The body is only cloth up to the point AA shown in the diagram. Beyond this the body is of boxlike construction without cross-members.

No particulars of the performance of the machine are available, but the impression given is that of a very trustworthy and speedy hydroplane, likely to give a rapid climb.

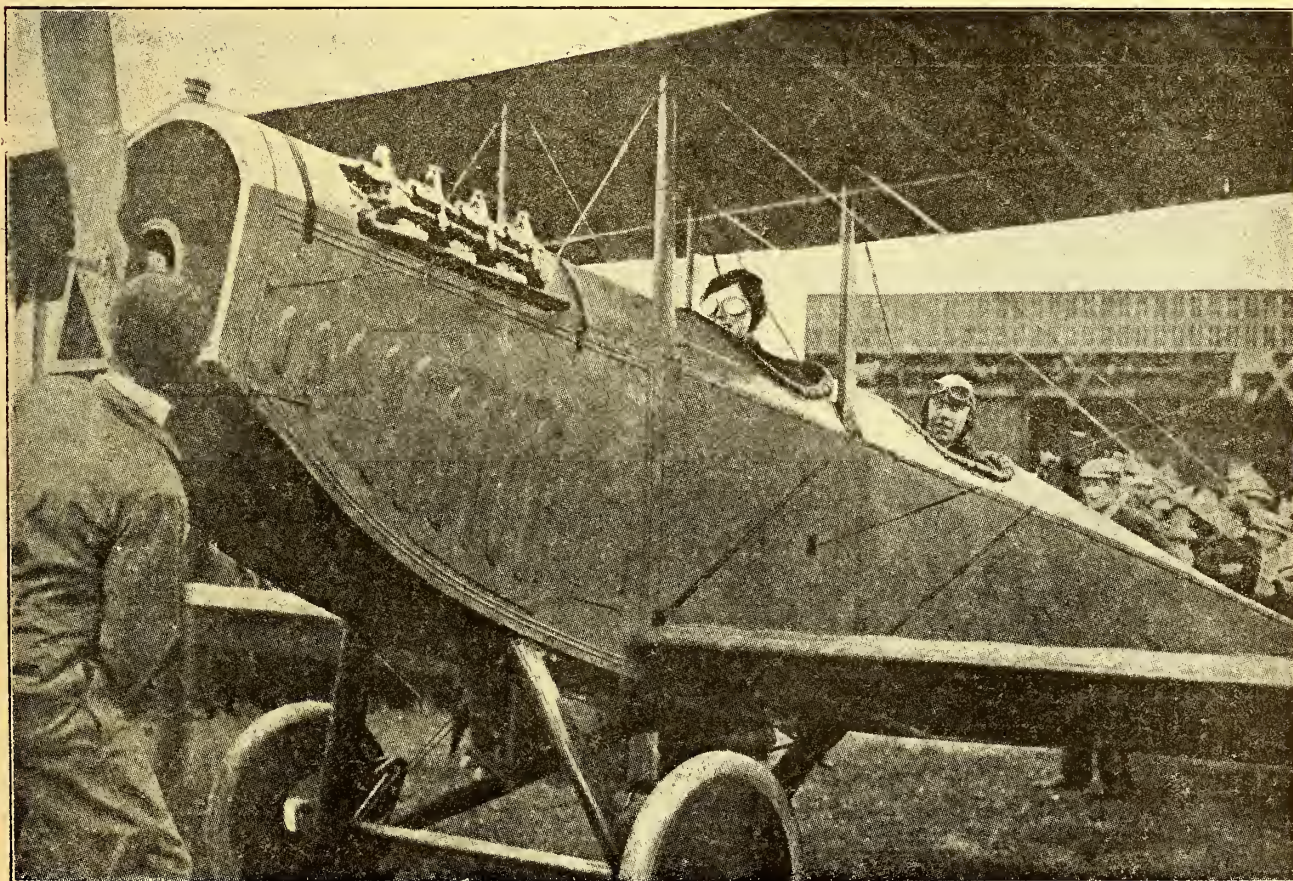
METEOROLOGY AND WAR.

The annual report of the Meteorological Committee says: "The variety of ways in which the weather affects warlike operations in all parts of the globe has become very apparent from the diversity of the information which the office is called upon to supply at short notice. The results of meteorological inquiries initiated in what appeared to be the remote interest of the theory of the circulation of the atmosphere have turned out to have important practical bearings, and collections of statistics compiled in the ordinary course of meteorological duty have now come to most usefully to meet urgent requirements."

In view of the importance of co-ordinating the experiences of Flying Officers with the work of the office and observatories in order to obtain more effective knowledge of the structure of the atmosphere for the use of the Air Services, the committee represented to the Director of Military Aeronautics the desirability of appointing a Professor of Meteorology to the R.F.C. (with the rank of Major during the war). The Director concurred, and, with the sanction of the Treasury, the Army Council approved the appointment of Lt. G. I. Taylor, R.F.C., to that office.

Mr. Taylor was Schuster Reader in Meteorology from February, 1912. His services were lent by the Committee to the Board of Trade for meteorological work on the ss. "Scotia," chartered for the investigation of ice in 1913. The report of the work of that voyage, it is stated, marked a new epoch in the history of meteorology.

A separate unit of the Royal Engineers has been created for meteorological service in the field. The service with the Expeditionary Force in France is under the command of Major Gold, one of the Superintendents of Division in the office, and that with the force in the Eastern Mediterranean under Capt. E. M. Wedderburn, D.Sc., W.S., F.R.S.E., honorary Secretary of the Scottish Meteorological Society, who offered his services to the office.



Miss Strickland, daughter of Sir Gerald Strickland, Governor of New South Wales, starting on a trip with Mr. W. J. Stutt, the instructor, at the opening of the New South Wales Aviation School. The machine is a Curtiss. Among others who made passenger trips were Mr. D. R. Hall (the Attorney-General), Captain d'Apice, and the Premier.

THE LATE LORD LLANGATTOCK.

All concerned with aviation will learn with very deep regret that Lord Llangattock has died of wounds received in France.

Lord Llangattock was the brother of the late the Hon. Charles Rolls, one of the great pioneers of British aviation, who was killed at the Bournemouth meeting in 1910. Another brother died in June of this year, and as Lord Llangattock was unmarried the title becomes extinct.

A sister of the late Lord Llangattock, the Hon. Lady Shelley, wife of Sir John Shelley, Bart., has also been closely concerned with aeronautics since the early days, and many photographs taken by this lady of and from German airships before the war have assisted materially in the education of those interested in airships in this country.

To her and to the late Peer's mother all will offer their deepest sympathy in the great losses they have sustained.

PRESENTATION AEROPLANES.

The Overseas Club announce that the following additional aeroplanes have been presented:—

IMPERIAL AIRCRAFT FLOTILLA.

69. Kwahu.—£1,500 presented by the Omanhene Chiefs and people of the Kwahu District of the Gold Coast.

70. Queenstown, Cape.—£1,500 presented by the residents of the Queenstown District of South Africa.

71. Shanghai Race Club, No. 2.—£2,250 presented by the residents of Shanghai, through Mr. H. H. Read.

72. Imperial Order Daughters of the British Empire, U.S.A.—Presented by the Imperial Order of the British Empire, U.S.A., per Mrs. J. Langstaff, President.

73. Hankow Britons.—£1,500 presented by the British residents in Hankow.

74. Auckland.—£2,500 presented by the residents of Auckland, through the Auckland Provincial Aeroplane Fund Committee.

AUSTRALIAN AIR SQUADRON.

75. New South Wales, No. 1 (the White Belltrees).—£2,700 presented by H. E. A. and V. White Belltrees, Scone, Upper Hunter.

76. New South Wales, No. 2 (the White Edenglassie).—£2,700 presented by Muswell Brook, Upper Hunter.

77. New South Wales, No. 3 (the Mrs. P. Kirby and Son).—£2,700 presented by Mrs. P. Kirby and Son, Cremorne, Sydney.

78. New South Wales, No. 4 (the F. J. White, Saumarez and Baldblair).—£2,700 presented by F. J. White and family, Saumarez, Armidale, N.S.W.

AIR BOARD REPORTS.

The following narratives were published by the Air Board on Oct. 30th:—

Sept. 15th.—A bombing party attacked trains in the vicinity of Cambrai; one bomb dropping from a height of 500 ft. exploded and blew up an ammunition train, a previous bomb having hit the engine. Another bomb was dropped in the midst of a mass of troops, who got out of the train. A truck of another train was also hit. In the course of this raid some of our pilots attacked transport, which was alongside the train, with machine-gun fire. Damage was also done to trains at several other stations.

Two of our pilots, while on an offensive patrol, encountered seventeen hostile aeroplanes at varying heights. They dived into the middle of the hostile formation and attacked. One pilot got to very close quarters with a hostile machine, which burst into flames, and was seen to plunge to earth. He then attacked a second machine, which was driven down and fell in a field. A third machine went down vertically, and was seen to crash.

Sec. Lt. "A," whilst on patrol, observing infantry on a road, dived down to 200 ft. and attacked with his machine-gun, firing about 100 rounds, and causing great panic and many casualties. He was subjected to very heavy rifle fire.

Sept. 21st.—Lt. "B," having dispersed a formation of six Rolands, got underneath the nearest machine and emptied a drum of ammunition into it. The enemy went down, and landed apparently under control. Lt. "B" then attacked a second machine from underneath, and fired two drums into the pilot's seat. The hostile machine was seen to plunge to earth. Later in the evening Lt. "B" destroyed another machine.

Sec. Lt. "C" attacked and brought down a hostile kite balloon. At 3,000 ft., when over Comines, he dived in the balloon, which was then rapidly descending. He opened fire at 400 yards, and finished his drum as he passed about 20 ft. over the balloon, which had by that time caught fire.

Sept. 23rd.—Sec. Lt. "D" and Corpl. "E" attacked a hostile machine near Sailly Saillisel. The German was driven down, and appeared to be out of control. Later, when near Morval, they attacked two hostile machines, one of which succeeded in getting in position in rear of our machine. Lt. "D" stalled the machines, and the observer stood up to use the rear gun, but he had barely pulled the gun into position when he was hit in the head and killed. The gun fell down, as the stand had not been clipped into position, and struck the pilot on the head. The pilot remembers nothing distinctly until he recovered consciousness on the way to a French Army headquarters.



A REMINISCENCE OF HAPPY DAYS.—This picture shows the aerodrome at Nice during the Great Nice Meeting in April 18th by a French amateur, and was given by Mr. Rolls to his chief engineer, Mr.

At about six p.m. Lt. "G" engaged four 2-seater Rolands. Approaching from behind, he scattered his opponents by firing one drum at them. He then got underneath the nearest machine, into which he fired ninety rounds. The machine caught fire, and was seen to plunge to earth.

Sept. 25th.—The following scheme, which was planned to intercept traffic on the Douai-Lille main line, was carried out. The railway station at Libercourt, sidings, and rolling stock were to be bombed, and an attempt made to attack trains going south, in the hope that they might be carrying troops or ammunition towards the Somme battlefield. Patrols, each of three aeroplanes, were first sent to attack neighbouring enemy aerodromes to prevent German aeroplanes from going up to interfere; smoke bombs were dropped at intervals to keep the aerodromes enveloped in smoke, and from time to time a high explosive bomb to show that our machines were still there. During this period two of our machines were to descend and attack the trains. The first train to appear was seen leaving Libercourt at about 1.40 p.m., and our machines dived down to attack it.

While descending a second train was seen coming up on a branch line towards Ostricourt, where it joins the main line, and one of our machines diverted on to it. The first train was attacked from a height of about 800 ft. near Ostricourt; six bombs were dropped. The engine was hit, became derailed, and two or three of the front coaches partly telescoped. German soldiers immediately began to alight, were fired on, and ran towards Ostricourt village and woods. There were so many men that the pilots said it would have been hard to miss them, and a large number were either killed or wounded. Meanwhile, the second train came to a standstill near the junction, as the wrecked train on the main line was blocking its way. The other machine attacked it with six bombs, two of which hit the train and one the engine. Troops also here began to descend, and were fired on. They fled towards the neighbouring village. Altogether between 600 and 700 rounds were fired by the two aeroplanes, and many German soldiers were hit. Neither of our machines was fired on. As soon as the attack on the trains began the main raiding party, composed of seven aeroplanes, and an escort, attacked Libercourt Station at about two p.m., where fourteen heavy and thirty-four smaller bombs were dropped. Station buildings, sidings, and rolling stock were hit, some carriages were wrecked, and one coach was afterwards observed to be lying crossways over the line. The patrol over Brovin Aerodrome destroyed a hangar in the course of its work.

Sept. 26th.—A contact patrol machine flew over Gird trench at between 300 ft. and 400 ft. during the morning. The Germans

in the trench held up their hands and waved white handkerchiefs. This information was transmitted to the ground station, and the Germans shortly afterwards surrendered to our troops.

These official extracts also record many instances in which our artillery, thanks to observations obtained by the Flying Corps, have been able to obtain direct hits on German batteries; of the bombing of enemy positions, railway stations, and transport, and the destruction of enemy aeroplanes and kite balloons.

AIRCRAFT IN THE LORDS.

On Oct. 30th Viscount Midleton asked the Under Secretary for War whether he could make any statement as to the condition of the forces in Mesopotamia.

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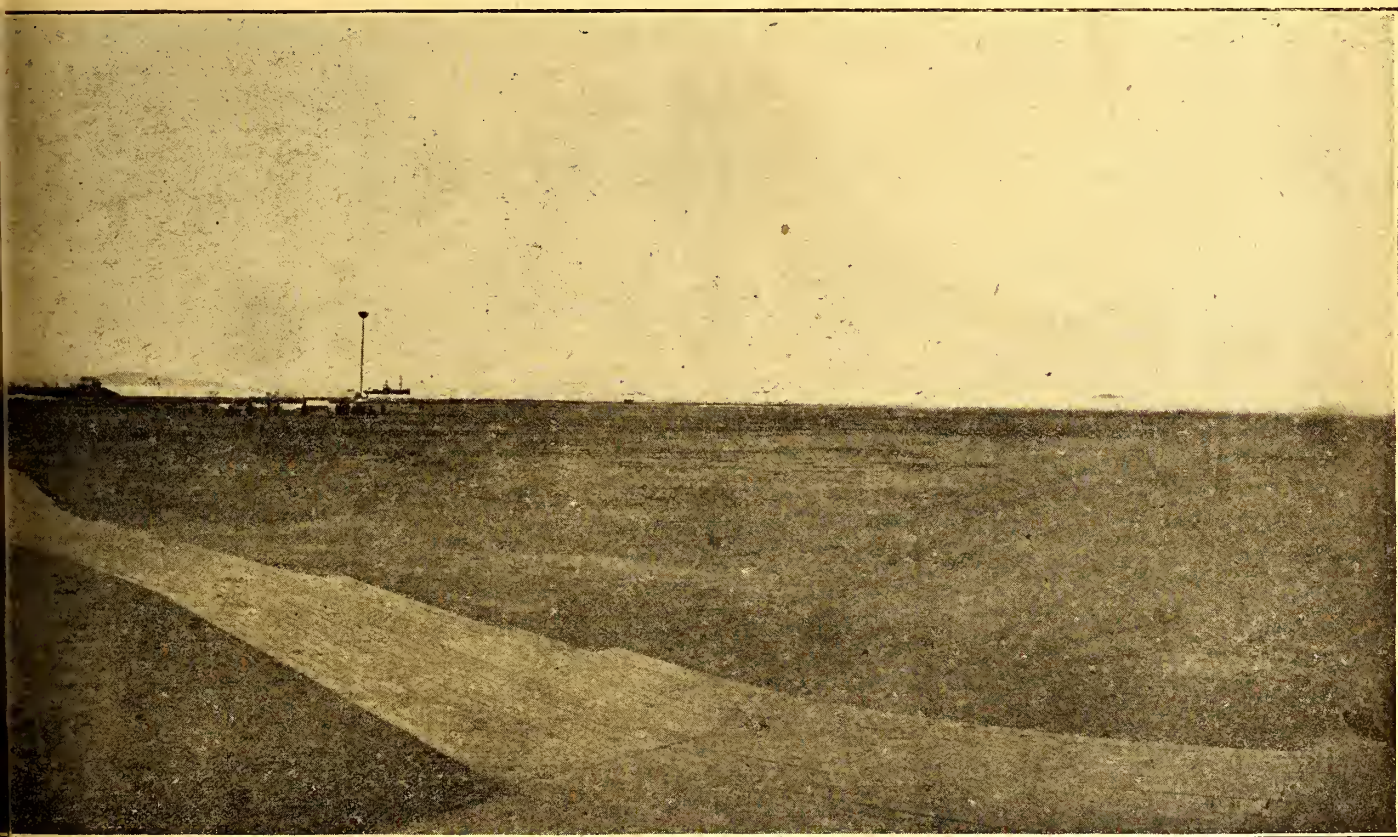
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ing of 1910. The machine in the air is a Wright, piloted by the late the Hon. Charles Rolls. The photograph was taken on 2 who has kindly lent it to this paper. Mr. Rolls was killed at Bournemouth in July of 1910.

THE LATE LORD LLANGATTOCK.

All concerned with aviation will learn with very deep regret that Lord Llangatock has died of wounds received in France.

Lord Llangatock was the brother of the late the Hon. Charles Rolls, one of the great pioneers of British aviation, who was killed at the Bournemouth meeting in 1910. Another brother died in June of this year, and as Lord Llangatock was unmarried the title becomes extinct.

A sister of the late Lord Llangatock, the Hon. Lady Shelley, wife of Sir John Shelley, Bart., has also been closely concerned with aeronautics since the early days, and many photographs taken by this lady and from German airships before the war have assisted materially in the education of those interested in airships in this country.

To her and to the late Peer's mother all will offer their deepest sympathy in the great losses they have sustained.

PRESENTATION AEROPLANES.

The Overseas Club announce that the following additional aeroplanes have been presented:—

IMPERIAL AIRCRAFT FLOTTILLA.

69. Kwahu.—£1,500 presented by the Omani Chiefs and people of the Kwahu District of the Gold Coast.

70. Queenstown, Cape.—£1,500 presented by the residents of the Queenstown District of South Africa.

71. Shanghai Race Club, No. 2.—£2,250 presented by the residents of Shanghai, through Mr. H. H. Read.

72. Imperial Order Daughters of the British Empire, U.S.A.—Presented by the Imperial Order of the British Empire, U.S.A., per Mrs. J. Langstaff, President.

73. Hankow Britons.—£1,500 presented by the British residents in Hankow.

74. Auckland.—£2,500 presented by the residents of Auckland, through the Auckland Provincial Aeroplane Fund Committee.

AUSTRALIAN AIR SQUADRON.

75. New South Wales, No. 1 (the White Belltrees).—£2,700 presented by H. E. A. and V. White Belltrees, Scone, Upper Hunter.

76. New South Wales, No. 2 (the White Edenglassie).—£2,700 presented by Muswell Brook, Upper Hunter.

77. New South Wales, No. 3 (the Mrs. P. Kirby and Son).—£2,700 presented by Mrs. P. Kirby and Son, Cremorne, Sydney.

78. New South Wales, No. 4 (the F. J. White, Saumarez and Bakblair).—£2,700 presented by F. J. White and family, Saumarez, Armidale, N.S.W.

AIR BOARD REPORTS.

The following narratives were published by the Air Board on Oct. 30th:—

Sept. 15th.—A bombing party attacked trains in the vicinity of Cambrai; one bomb dropping from a height of 500 ft. exploded and blew up an ammunition train, a previous bomb having hit the engine. Another bomb was dropped in the midst of a mass of troops, who got out of the train. A truck of another train was also hit. In the course of this raid some of our pilots attacked transport, which was alongside the train, with machine-gun fire. Damage was also done to trains at several other stations.

Two of our pilots, while on an offensive patrol, encountered seventeen hostile aeroplanes at varying heights. They dived into the middle of the hostile formation and attacked. One pilot got to very close quarters with a hostile machine, which burst into flames, and was seen to plunge to earth. He then attacked a second machine, which was driven down and fell in a field. A third machine went down vertically, and was seen to crash.

Sec. Lt. "A," whilst on patrol, observing infantry on a road, dived down to 200 ft. and attacked with his machine-gun, firing about 100 rounds, and causing great panic and many casualties. He was subjected to very heavy rifle fire.

Sept. 21st.—Lt. "B," having dispersed a formation of six Rolands, got underneath the nearest machine and emptied a drum of ammunition into it. The enemy went down, and landed apparently under control. Lt. "B" then attacked a second machine from underneath, and fired two drums into the pilot's seat. The hostile machine was seen to plunge to earth. Later in the evening Lt. "B" destroyed another machine.

Sec. Lt. "C" attacked and brought down a hostile kite balloon. At 3,000 ft., when over Comines, he dived in the balloon, which was then rapidly descending. He opened fire at 400 yards, and finished his drum as he passed about 20 ft. over the balloon, which had by that time caught fire.

Sept. 23rd.—Sec. Lt. "D" and Corpl. "E" attacked a hostile machine near Sully Saillies. The German was driven down, and appeared to be out of control. Later, when near Morval, they attacked two hostile machines, one of which succeeded in getting in position in rear of our machine. Lt. "D" stalled the machines, and the observer stood up to use the rear gun, but he had barely pulled the gun into position when he was hit in the head and killed. The gun fell down, as the stand had not been clipped into position, and struck the pilot on the head. The pilot remembers nothing distinctly until he recovered consciousness on the way to a French Army headquarters.

At about six p.m. Lt. "G" engaged four 2-seater Rolands. Approaching from behind, he scattered his opponents by firing one drum at them. He then got underneath the nearest machine, into which he fired ninety rounds. The machine caught fire, and was seen to plunge to earth.

Sept. 25th.—The following scheme, which was planned to intercept traffic on the Douai-Lille main line, was carried out. The railway station at Libercourt, sidings, and rolling stock were to be bombed, and an attempt made to attack trains going south, in the hope that they might be carrying troops or ammunition towards the Somme battlefield. Patrols, each of three aeroplanes, were first sent to attack neighbouring enemy aerodromes to prevent German aeroplanes from going up to interfere; smoke bombs were dropped at intervals to keep the aerodromes enveloped in smoke, and from time to time a high explosive bomb to show that our machines were still there. During this period two of our machines were to descend and attack the trains. The first train to appear was seen leaving Libercourt at about 1.40 p.m., and our machines dived down to attack it.

While descending a second train was seen coming up on a branch line towards Ostricourt, where it joins the main line, and one of our machines diverted on to it. The first train was attacked from a height of about 800 ft. near Ostricourt; six bombs were dropped. The engine was hit, became derailed, and two or three of the front coaches partly telescoped. German soldiers immediately began to alight, were fired on, and ran towards Ostricourt village and woods. There were so many men that the pilots said it would have been hard to miss them, and a large number were either killed or wounded. Meanwhile, the second train came to a standstill near the junction, as the wrecked train on the main line was blocking its way. The other machine attacked it with six bombs, two of which hit the train and one the engine. Troops also here began to descend, and were fired on. They fled towards the neighbouring village. Altogether between 600 and 700 rounds were fired by the two aeroplanes, and many German soldiers were hit. Neither of our machines was fired on. As soon as the attack on the trains began the main raiding party, composed of seven aeroplanes, and an escort, attacked Libercourt Station at about two p.m., where fourteen heavy and thirty-four smaller bombs were dropped. Station buildings, sidings, and rolling stock were hit, some carriages were wrecked, and one coach was afterwards observed to be lying crossways over the line. The patrol over Brovin Aerodrome destroyed a hangar in the course of its work.

Sept. 26th.—A contact patrol machine flew over Gird trench at between 300 ft. and 400 ft. during the morning. The Germans

in the trench held up their hands and waved white handkerchiefs. This information was transmitted to the ground station, and the Germans shortly afterwards surrendered to our troops.

These official extracts also record many instances in which our artillery, thanks to observations obtained by the Flying Corps, have been able to obtain direct hits on German batteries; of the bombing of enemy positions, railway stations, and transport, and the destruction of enemy aeroplanes and kite balloons.

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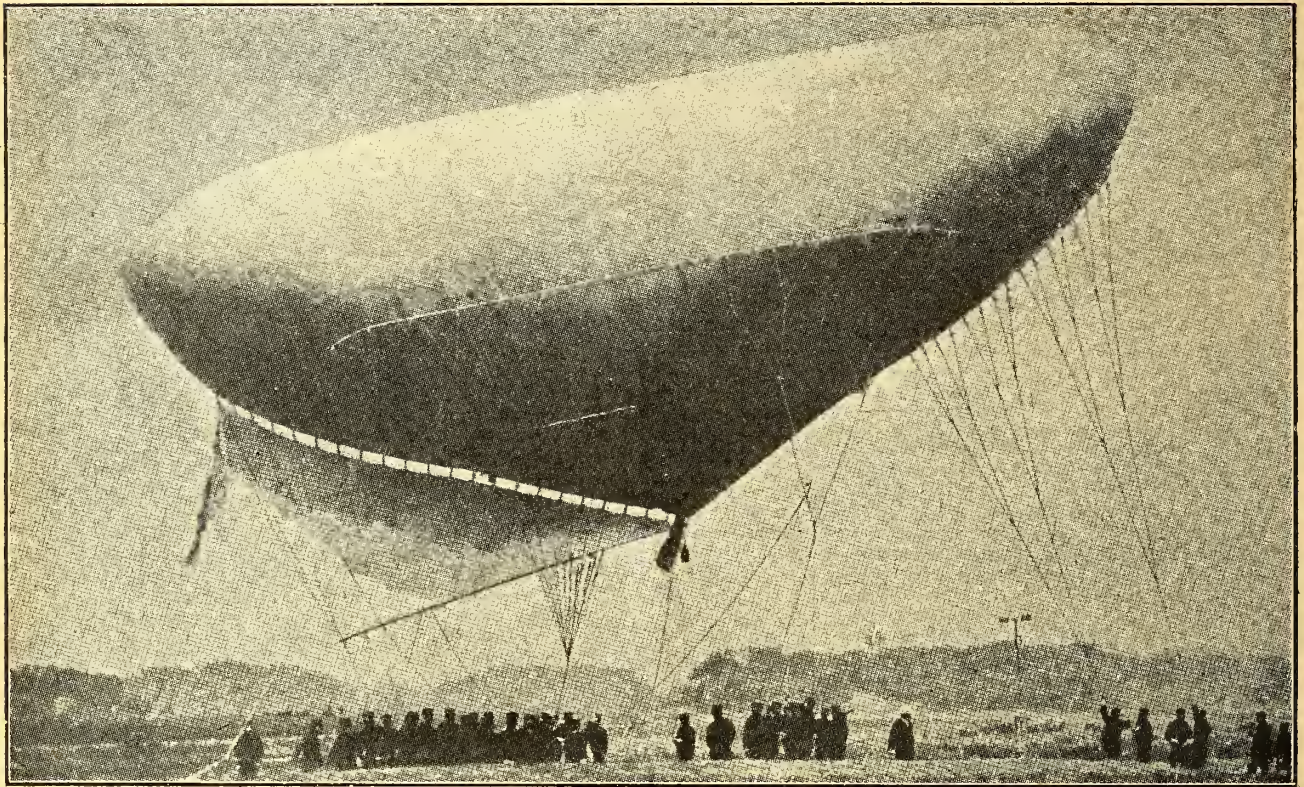
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A REMINISCENCE OF HAPPY DAYS.—This picture shows the aerodrome at Nice during the Great Nice Meeting in the Spring of 1910. The machine in the air is a Wright, piloted by the late the Hon. Charles Rolls. The photograph was taken on April 18th by a French amateur, and was given by Mr. Rolls to his chief engineer, Mr. Leaper, who has kindly lent it to this paper. Mr. Rolls was killed at Bournemouth in July of 1910.

SOME KITE-BALLOON HISTORY.

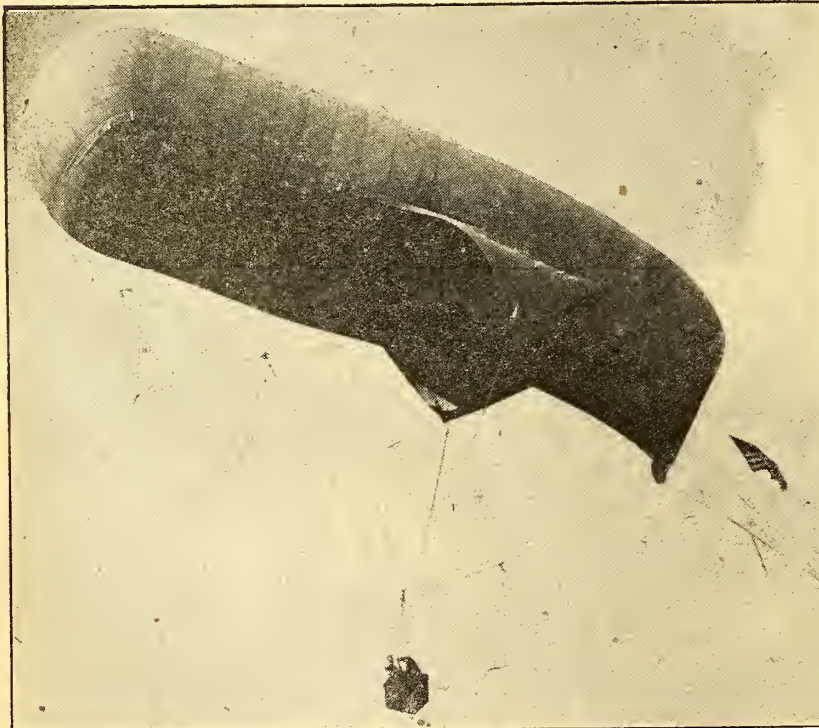


The "Yamada" kite-balloon, an early Japanese effort used in the Russo-Japanese War.

It is not absolutely clear whether the invention of the kite-balloon should be credited to Germany or Japan. During the siege of Port Arthur the Japanese used the envelope of a curious triangular-shaped airship, called the "Yamada," which had been

the gas-balloon, was almost unmanageable as a captive except in the calmest of weather. The difficulty was that it insisted on steadily rotating at the end of its cable, and every gust of wind which struck it made it oscillate violently backwards and forwards, and it was impossible for the best sailor in the world to stand more than a very short period in the car, as the combination of erratic movements had severe physical effects upon the occupant.

It was a matter of observation that the common or garden kite lifted and travelled into the wind as it was struck by a gust, whereas the captive balloon descended and travelled down wind. The Parseval Company set to work to combine the two phenomena. They constructed a sausage-shaped gas-bag and suspended it from a cable in such a manner that it hung obliquely in the air with one end considerably higher than the other. To the lower end of the envelope they attached a large bag open to the air in the direction of the upper extremity. This had the effect of turning the lower end of the balloon down wind and holding it there, thus preventing rotation. The sloping underside of the



unsuccessful as a dirigible, as an observation balloon. They fitted one end of the envelope with an enormous fin, and attached the car by a series of ropes. The effect of the fin was to hold the envelope head to wind and to prevent it rotating, so that it was actually a kite-balloon. About this time the German Parseval Airship Company also experimented with captive balloons with the idea of preventing the profound physical discomfort experienced in the ordinary spherical captive balloon. This primitive aerostat, which had been used in almost every war since the invention of

The Goodyear Kite-Balloon, an American attempt to do away with the air-bag.




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envelope acted as a lifting plane, and the harder the wind blew the stronger the lift exerted, and with the balloon properly balanced this could be made exactly to compensate the tendency of the wind to drive the gas-bag to leeward.

The success of these balloons was so marked that they were promptly adopted by the German Army, but none of the Allied armies would look at them, because it was considered that their destruction in war-time would be too simple to make them of any practical use, but before the outbreak of war the Belgian Army had been persuaded into buying a single sample. This balloon was promptly put into service, and was found to be of very considerable use, and after months of war an agitation was raised that they should be tried in the British Army. The British Army would have none of them, but the Royal Naval Air Service carried out experiments and did quite a lot of work with imitation Parseval kite-balloons, both in France and elsewhere, and later on they were adopted both by the British and French armies, and used extensively on all the different fronts. The design has been but slightly modified from the original German pattern, but a new type exists which has a remarkable performance. Under certain circumstances it had been found that the use of inverted parachutes attached to a rope, and playing the part of a tail to an ordinary kite, was an advantage for ensuring stability.

Considering the size of these kite-balloons, their relative immunity from destruction is rather surprising, although many of them have been brought down both by gun-fire and by enemy aviators, the Germans being particularly unfortunate in losses of this character.

As a precaution in case of destruction of the envelope by incendiary missiles it is customary to carry parachutes for the escape of the crew in case of need, and these parachutes are generally attached to the occupants of the balloon all the time they are in the air.

Kite-balloons have been found of considerable use for artillery spotting, and for similar purposes, and considerable ingenuity has been called forth in using them to the best advantage. For instance, on more than one occasion enemy batteries have been discovered through the gunners being too methodical in their bombardment. A German battery has shelled a position consistently at regular intervals for a number of hours, and its position has been discovered by the simple process of filling a kite-balloon, uncoiling several thousand feet of cable upon the ground, and letting the balloon up with a rush on the expiry of the last moment, before the next discharge was due, when the

observer has been able to see flashes from the guns before it was possible for their fire to be checked.

One cannot, of course, describe the methods employed for the destruction of enemy kite-balloons, but there is no doubt that the Allies' aviators make the use of these vehicles impossible so long as aeroplanes are able to cross the enemy's lines.—W. L. W.

ON THE POSSIBILITIES OF A NEW TYPE OF AIRSHIP.

The following scheme has been received from a correspondent, for whose soundness the editor does not vouch:—

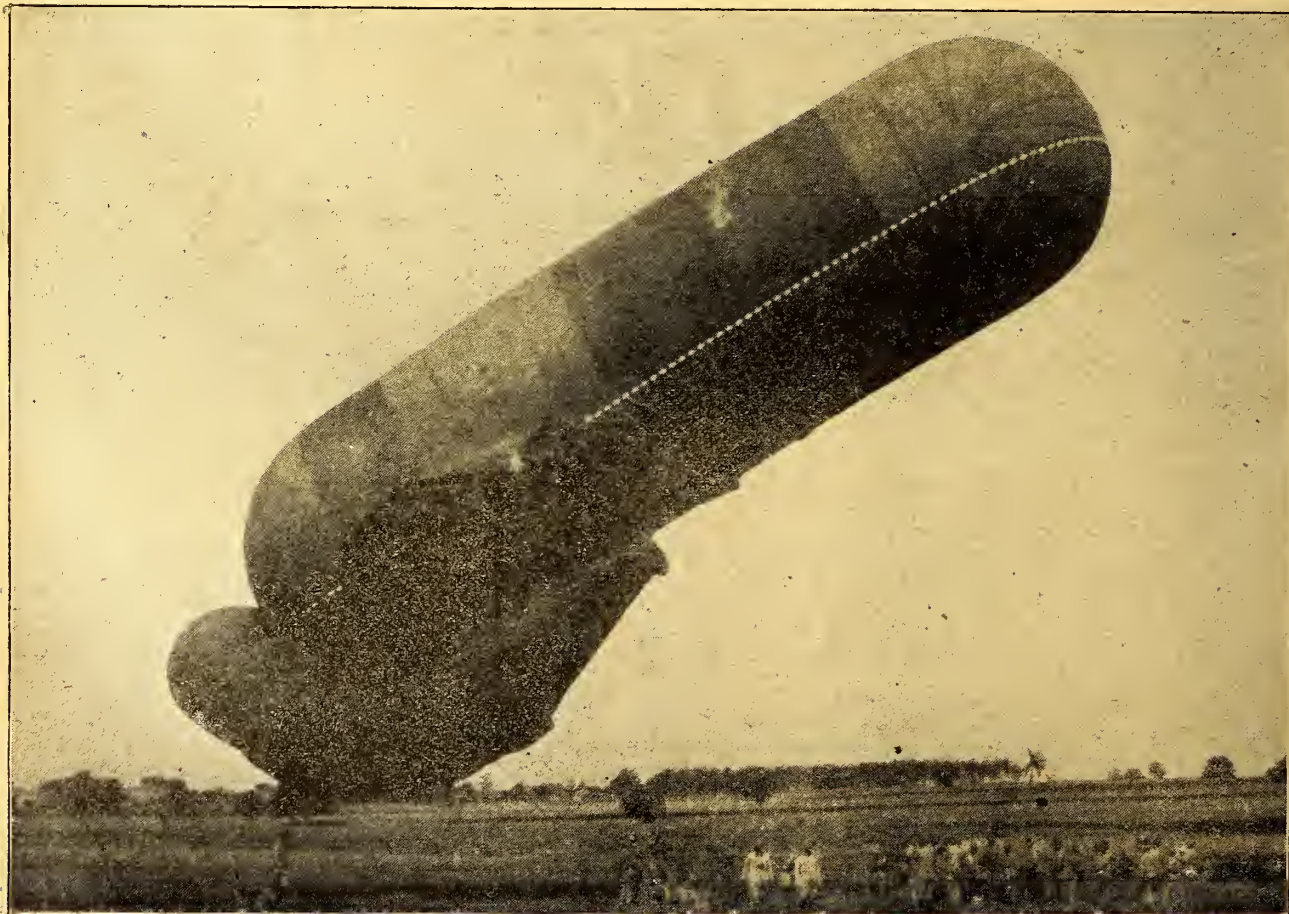
In the past it has been usual to class lighter-than-air vessels into three main categories, namely, rigid, semi-rigid, and non-rigid. The typical examples of case No. 1 are the Zeppelins and the Schutte-Lanz airships. The semi-rigid types are typified by vessels of the nature of the Lebaudy, and such ships as Parsevals are known as non-rigid.

The rigid airship depends entirely upon the framework of the envelope to preserve its contour, whether it happens to be inflated or not, the gas chambers being expanded by the pressure of the hydrogen independently of the actual shell of the airship. In the case of the semi-rigid the envelope itself depends upon the gas pressure to keep it distended; most of the compression strains on the envelope are taken either by a long girder running almost from end to end of the airship or by a long built-up spar.

On the other hand, the non-rigid airships depend entirely upon the correct degree of inflation, not merely to preserve their contour but to take all the compression strains that are set upon the envelope by the gear from which the car of the airship is suspended.

Naturally all three classes of airship have their adherents and equally they have their points of advantage and of disadvantage. Looking at the question from an unbiassed point of view it seems just possible that the best points of two or possibly all three classes might be combined.

The open work shell which is formed by the lattice girders of a rigid airship is naturally a complicated piece of engineering, and entails an enormous amount of heavy material in order that each section shall be of sufficient rigidity to support the immediate load which it carries, and also that it may effectually combine with the remainder of the airship to ensure rigidity of the whole. To the unscholarly mind, therefore, it seems just possible that if the shell of a rigid airship were left to carry out



The standard German type of Parseval-Kriegsfeld kite-balloon, seen here in use by the Austrian Army.

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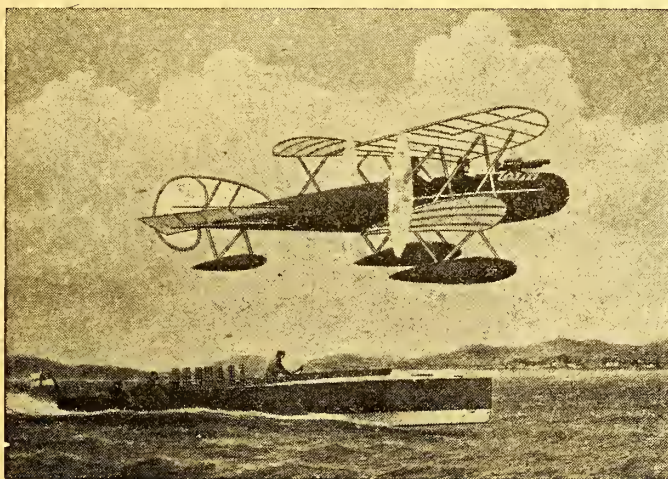
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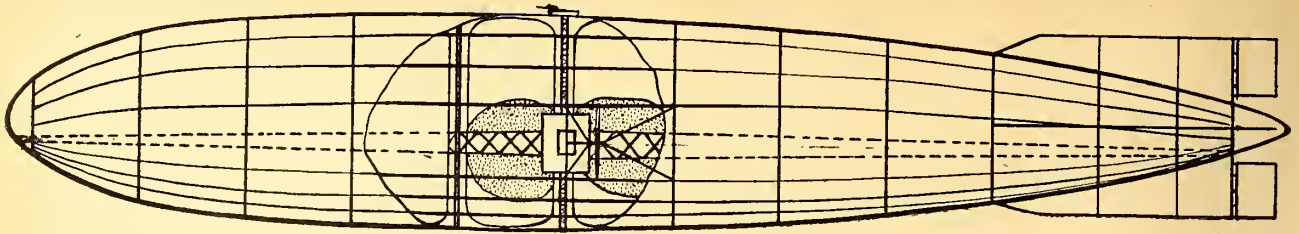
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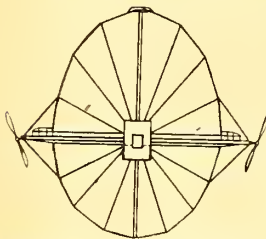
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



A Correspondent's Quaint Idea for a real streamline airship.

the duty of supporting the gas chambers, its work could be very materially reduced; but if this is done it seems essential that an additional member be introduced which is to stand the stress of preserving the rigidity of the airship and also of supporting the crew, engines and other non-lifting units.

The obvious method indicated is to use a spar the length of the airship of a similar or adjacent nature to that employed in the semi-rigid, but the question to be determined is where this can be placed to obtain the greatest amount of rigidity with the smallest possible weight and the least possible interference to the sailing qualities of the airship.



End View of the Proposed Airship.

loads are to be attached directly to it, it is clearly impossible to secure the stability of the airship.

Eliminating these two positions for such a spar it is necessary to look about for a compromise. The most obvious plan to adopt is (1) to construct an airship of elliptical section with the spar passing through one of the axes of the ellipse, or (2) to employ an airship of circular section with the spar running eccentrically and below the axis of the circle. This point is chiefly a matter for engineers to determine as to which section presents the greatest possibilities from the structural point of view.

It is therefore suggested that the framework of the airship under discussion should take the form of a number of hoops of equal size threaded along a spar through a predetermined common axis. The section of any one of these hoops would be as indicated in Diagram No. 1. Both the periphery of the hoop and the spokes or distance pieces would have to be of fairly robust proportions as, of course, they would take compression as well as tensional strains.

In its crude form an airship on these lines would be in the nature of a cylinder with rounded ends, much on the lines of the earlier Zeppelins, but doubtless in a more refined reform it could be constructed in true streamline shape. As regards the longitudinal spar, this of course would be of spindle section tapering largely towards the bow and stern, but of considerable proportions in the middle, and it is at the centre of this spar that it is suggested the engines, crew, and non-lifting parts of the insulation would be accommodated.

The natural form which the load carrying portion of the airship would take would be a girder braced chamber right at the centre of the spar. As a matter of fact it would probably form the centre unit of this member as indicated in Diagram No. 2.

Once the rigidity of the framework of the airship had been secured by the correct design of the transverse hoops along the axial spar the longitudinal members outlining the periphery of the hoops need be of the lightest possible description, and might merely take the form of a lattice to enclose the gas chambers. One of the few difficulties to be surmounted would be the arrangement of a certain amount of cross bracing between the transverse hoops and the central spar in such a way that it would not unduly interfere with the accommodation of the gas chambers.

The engines would be situated along the centre line with the cabin, and of course every precaution would have to be taken that fire should not reach the surrounding gas chambers. This should be readily secured by suitable paneling and a proper system of ventilation.

The arrangement to which the necessary propellers for such an airship would lend themselves most readily would be a system of bevel gears radiating sideways and upwards and even possibly diagonally from the engines through the central gas chambers, and these could be arranged in a single row round the outside of the airship or in a couple of rows as circumstances seem to dictate.

As regards the accommodation for the crew and the necessary

arrangements for observing the ground, this could very well take the form of a transverse passage after the style of a ship's bridge, running from one side of the airship to the other, and arrangements could also be made for a passageway to lead from the central chamber to a platform on top of the envelope, and if need be to a gallery beneath. Needless to say the propeller shafts could be led through these passages if required.

Of course in an airship of this description the usual control apparatus in the form of fixed and movable vertical and horizontal fins would be employed, and it would seem that if the airship were correctly proportioned no particularly difficult problems of handling would manifest themselves.

The writer of these notes is in no sense an engineer nor does he claim to be an inventor, and they are published merely as a topic for discussion more than as any definite assertion that it is possible or desirable that such an airship be built. He is willing to receive any kind of criticism as regards the notion, and frankly expects that most of it will take the form of ribald ridicule. Nevertheless, if the suggestion acts as food for some more capable mind to place his finger upon the practical points in the scheme, it will have done its work.

If the lay-out of this hypothetical airship does happen to present the remotest chances of presenting engineering possibilities it appears that it ought to come out a good deal stronger than any rigid airship that has yet been built, and of course it would bring down head resistance to the irreducible limit.



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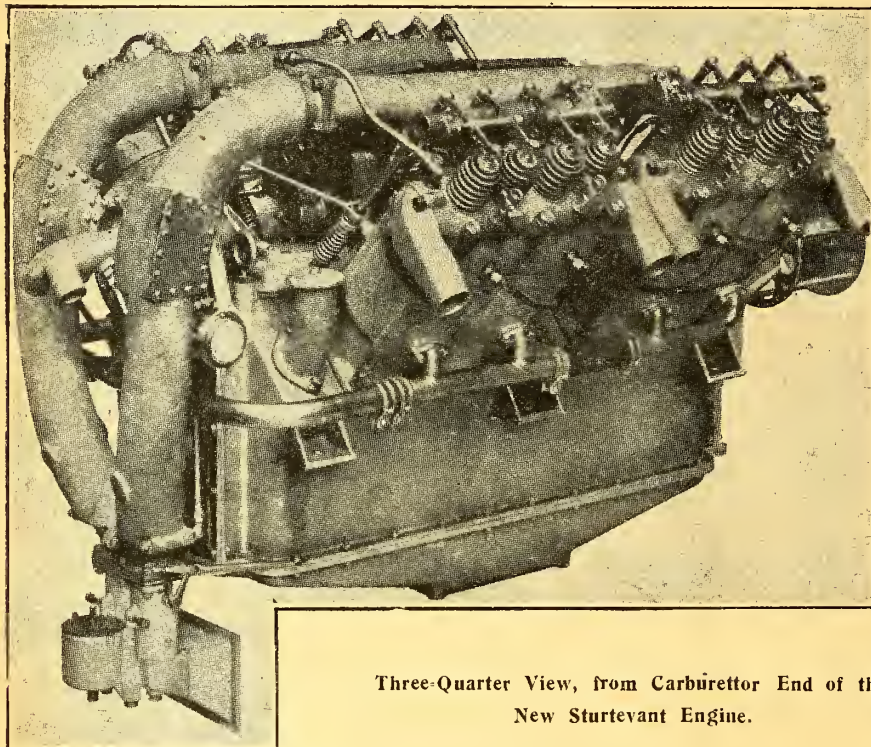
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The New Sturtevant Engine.

The B. F. Sturtevant Company, of Hyde Park, Boston, Mass., U.S.A., have produced a new edition of their 140 h.p. 8-cylinder "V" engine, known as model 5a, type 8. This model presents many alterations from earlier patterns.

The new motor has a bore of 4 inches and a stroke of $5\frac{1}{2}$ inches (equivalent to 102 by 140 mm.), and is designed to run at 2,000 r.p.m., the propeller shaft being driven by an integral reducing gear, which can be arranged to give any desired ratio, the standard shaft being arranged to turn the propeller at 1,200 r.p.m.



Three-Quarter View, from Carburettor End of the New Sturtevant Engine.

The motor is also designed to permit of a direct drive if required, and the necessary alterations can be made in a matter of an hour.

The cylinders are cast in pairs from an aluminium alloy complete with water-jackets, each cylinder being fitted with a steel sleeve to act as a piston bearing. The cylinder-heads, also of aluminium, are detachable, and contain passages to circulate cooling water over the entire head, a distinct advantage in view of the over-head valves, which are thus kept at a reasonably low temperature. The water passages in the cylinder-heads are, naturally, in direct communication with the water-passages in the cylinder walls.

The over-head valves are operated by push-rods and rockers, and are of such a size as to permit high volumetric efficiency. Adjusting screws are fitted to the valve rocker arms, which enable exact adjustment to be obtained, and cam-rollers are interposed between

the cams and the push-rods to reduce the side-thrust of the push-rods. A system of double springs is employed, which greatly reduces the stresses to which the springs are subjected, and ensures reliability. A spring of large size returns the valve, and a second spring located at the cylinder base keeps the push-rod up to its work.

The pistons are made from a special aluminium alloy, well ribbed internally for cooling, but of light weight, and fitted with only two piston rings, both near the top of the piston. The gudgeon pin is hollow, and made of hardened chrome nickel steel. The pin is allowed to turn both in the piston and in the connecting-rod bush.

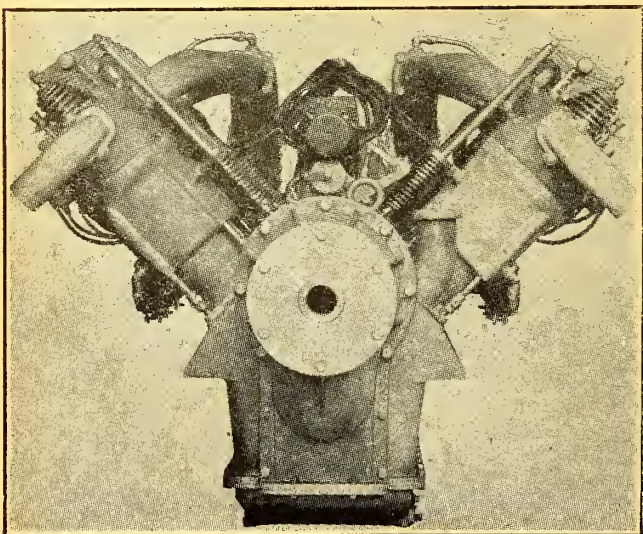
The connecting-rods are of H section machined from forgings of chrome nickel steel with a tensile strength of 280,000 pounds per square inch. The big ends are lined with white metal, and the small ends bushed with phosphor bronze. The connecting-rods take their bearings side by side on the crankshaft, the cylinders being off-set to permit of this arrangement.

The crankshaft is machined from high-grade chrome nickel steel. It is $2\frac{1}{4}$ inches in diameter, and bored hollow throughout. It is carried on three large bronze-backed white-metal bearings, of a special design which ensures the cohesion of the two metals.

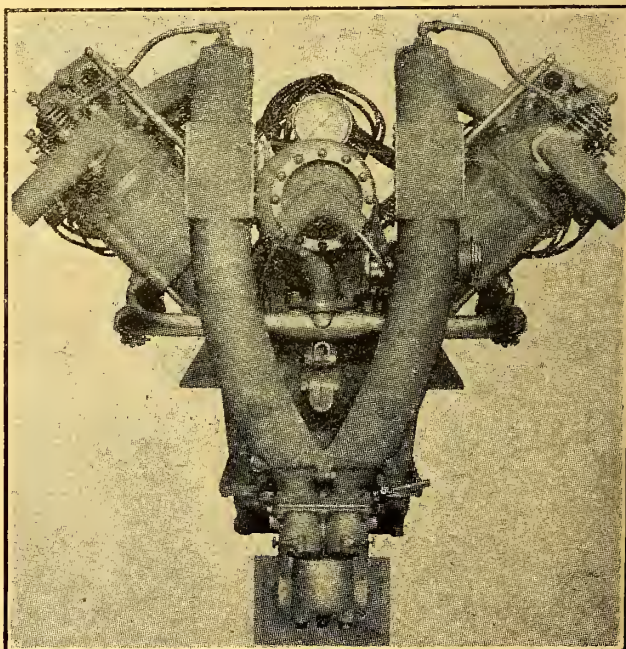
The crank-case is made from aluminium alloy, designed to give great strength and rigidity, combined with light weight. The sides of the crank-case extend considerably below the centre line of the crankshaft, ensuring great stiffness, the bottom half of the crank-case forming merely a cover and oil-sump.

The propeller-shaft is carried on two large ball-bearings, and is driven from the crankshaft by hardened chrome nickel steel spur-gears. These gears are contained within an oil-tight casing attached direct to the crank-case, and a ball-thrust bearing is provided on the shaft to take the thrust of the propeller or tractor-screw, as the case may be. Should the engine be required for a direct drive, a stub-shaft is fastened direct to the crankshaft, and fitted with a double-thrust bearing.

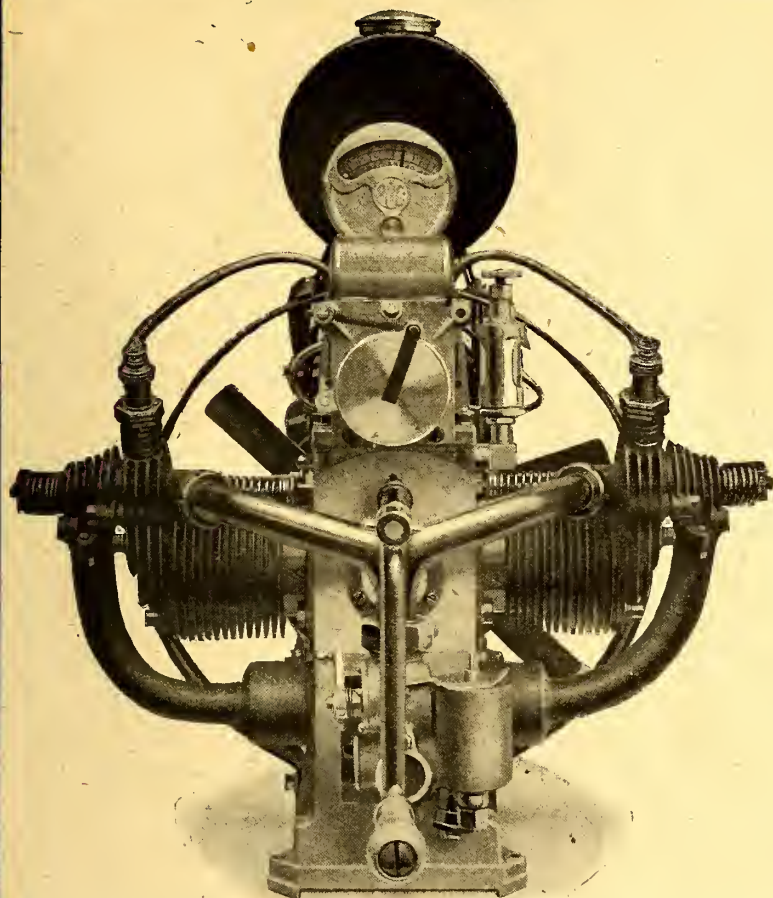
The cam-shaft is contained within the upper half of the crank-case between the two groups of cylinders, and is carried on six bronze bearings. The Sturtevant Company attach much importance to the design of their cams in attaining great power at high speeds. The gears operating the cams, magneto, oil and water pumps are installed inside an oil-tight casing which acts as an oil-bath.



Propeller End of the Sturtevant.



Carburettor End of the Sturtevant.



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Oil Consumption .18 galls. per hour.

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Lubrication is of the complete forced-feed system, oil being supplied to every bearing in the engine by a single rotary oil-pump driven by gears from the crank-shaft. Oil passages from the pump leading to the main bearings are cast integral with the base. The hollow crank-shaft leads oil to the connecting-rod bearings, and the hollow cam-shaft distributes oil to the cam-bearings.

The oil-sump contains about a gallon of oil, which is screened from the interior of the engine by a fine mesh, covering the whole surface of the lower half of the crank-case. The oil-circulating pump naturally draws oil from this sump, but the supply of oil circulated through the engine is not confined to this alone, as an auxiliary pump driven from the cam-shaft circulates the oil from the sump through the main oil tank in the aeroplane, and keeps a continuous supply of fresh cool oil pouring back into the sump, so that the temperature of the oil delivered to the engine by the main pump is kept very low.

The carburettor is of the Zenith duplex type with two mixing chambers and only one float, each jet supplying one group of four cylinders. The carburettor is fitted on the rear end of the motor below the level of the crank-case, permitting of gravity-feed. The gas is fed to the cylinders through water-jacketed manifolds, the jackets and manifolds being cast of aluminium in one piece.

Ignition is accomplished by two 8-cylinder magnetos installed between the two groups of cylinders. Each cylinder is provided with double ignition by means of two sparking-plugs screwed into water-cooled sockets on the sides of the cylinder heads. The magnetos are synchronised by a vernier coupling allowing accurate adjustment.

The water circulation is accomplished by a centrifugal pump. A starting crank is provided, by which the motor can readily be started from the machine, or an air-starter can be fitted if desired.

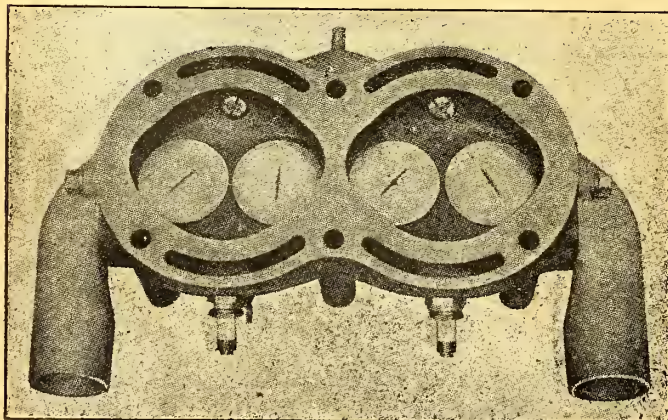
The weight of the motor, complete with carburettor, magnetos, starting crank, propeller hub flange and bolts is 514 pounds, which is not excessive for a motor of this power.—W. L. W.

LONDON AS IT ISN'T.

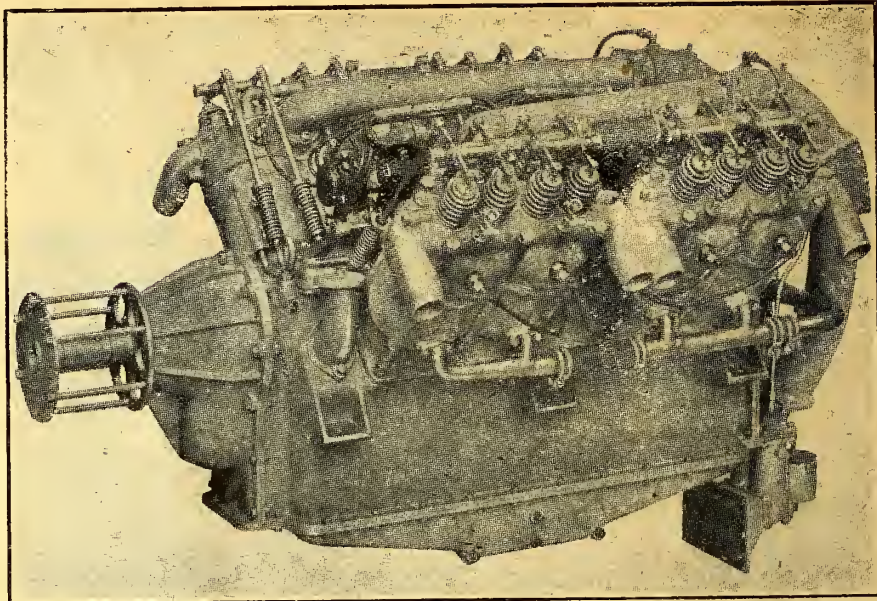
The Berlin "Kreuzzeitung" says:—

Two characteristic features of the London streets, the "hansoms" and the comical "sandwichmen," have entirely disappeared. For the one nobody save munition workers have any money to spare; for the other there is nothing to do, because only 5 per cent. of the theatres, which formerly employed them for advertising purposes, are open. The rest, with the exception of three in the Strand, which were smashed to atoms in a recent Zeppelin raid, are closed, pending the advent of peace and better days.

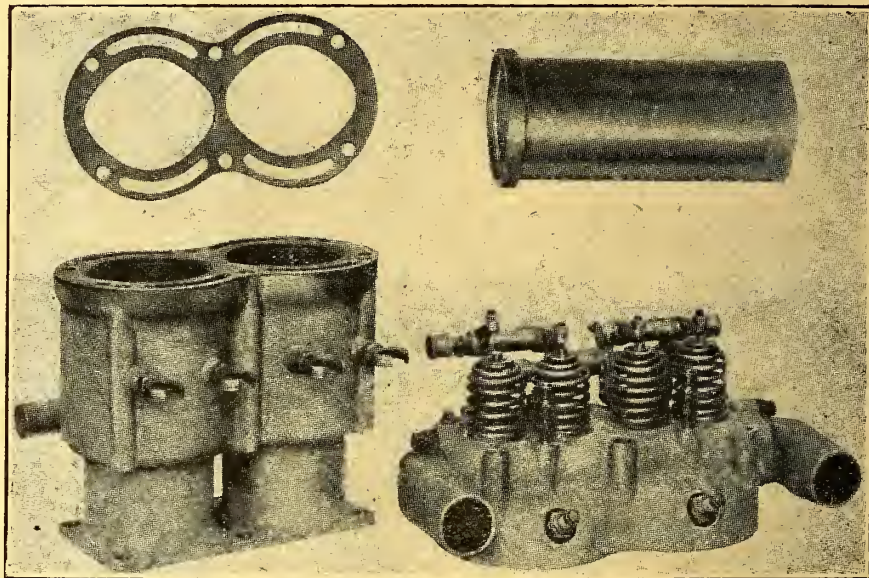
[One would have thought that the "three theatres" in the Strand



Underneath View of the Sturtevant Cylinder Heads.



Three-Quarter View from Crank-Shaft End of the Sturtevant.



Sturtevant Cylinder Parts, showing the Cylinders, the Gasket, the Cylinder Liner, and the Cylinder Heads.

would have been even more effectively closed than the remainder! —Ed.]

THE R.N.A.S. COMFORTS FUND.

The following cash contributions have been received by the hon. Treasurer of the Fund during the past week:—The Sunbeam Motor Car Co., Ltd., £20; Lady Samuel, £10; total to date, £1,991 19s. 7d.

Further contributions in cash and kind should be sent to Mrs. Sueter, The Howe, Watlington, Oxon.



Underneath View of the Sturtevant Crank Case.

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A "TRIPLE-SLIDE" AEROPLANE CALCULATOR.

[Though the editor of THE AEROPLANE does not know a slide-rule from a syllogism, he has all the respect for a slide-rule which the ignorant always have for the things they do not understand. When, therefore, an enterprising American introduces a "triple-slide" rule, the editor is awed into silence. He is, however, assured that the instrument works, and, therefore, leaves the purveyors of this priceless weapon of precision to speak for themselves.]

"Four simple words that cover years of hard study and labour. An instrument that simply and automatically calculates all characteristics and the main factors of any aeroplane, or proposed aeroplane, without any scientific data or figures to work out and contend with. A truly wonderful instrument. We feel sure that you are interested.

"The 'Triple-Slide' is a revelation in aeronautics. There is nothing like it or similar to it in any country. Heretofore, an aeronautical engineer had to figure for days, on what can now be accomplished in a few minutes by the most inexperienced novice.

"To do the work of the 'Triple-Slide,' you would have to 'wade' through hundreds of books, read foreign languages, and change their systems of units and measures into ours. You would have to know aerodynamics from the beginning up to the present day. You would have to be an aeronautical engineer. [Murmurs from the crowd expressive of horror.]

"The 'Triple-Slide' will startle you—think of it—in a few minutes' time you can calculate the altitude record—the minimum horse-power—the climbing speed—the gliding angle, and all other characteristics. We know this is hard for you to believe—the 'Triple-Slide' Aeroplane Calculator has not been on the market long enough. It alone makes this possible, and remember, you do not have to know the first principle of flying to do an aeronautical engineer's work. The 'Triple-Slide' cannot lie, it is positive—accurate.

"We positively guarantee the 'Triple-Slide' Aeroplane Calculator to be as represented. Your money refunded within thirty days if you are not more than pleased.

"We want to hear from you—Are we going to?

"(Signed) STANDARD AERONAUTICAL COMPANY."

224, S Jefferson Street. Chicago, Ill., U.S.A.

AEROPLANE CALCULATIONS.

[The manner of the foregoing address may startle the British engineer who is used to the stolid, not to say stereotyped, catalogue of the British instrument maker, but there is no good reason why a man should not be ingenious in advertising as well as in designing calculating machines. Therefore, it is worth while for serious engineers to consider the following notes on the Triple-Slide Rule.]

All aeroplane calculations are based on the used wing curve.

There is no process or system known whereby aeroplane calculations can be made without knowing the laboratory test of the wing curve.

The characteristics of the wing curve which influence the results of any and all aeroplane calculations are known as the lift and drag co-efficients. The ratio of the drag to the lift is known as the effectiveness of the wing.

Every wing or plane moved against the air or held stationary in a current of air creates a certain amount of backward "pull" which is known as the drag. The drag is always contrary to the forward motion of the aeroplane, and is measured by the laboratory test giving the amount of "pull" created by a wing of one square foot when moved horizontally one mile per hour under a certain angle of incidence. This measurement is known as the drag co-efficient, as it is multiplied by the number of square feet used in the wing and the square of the speed in miles per hour attainable by the aeroplane to give the entire drag of the wing.

The lift is the power of the wing to overcome gravity, and is always vertical to the forward motion of the aeroplane. The lift is measured by the laboratory test giving the number of pounds a wing of one square foot can lift when moved horizontally one mile per hour under a certain angle of incidence. This measurement is known as the lift co-efficient, as it is multiplied by the number of square feet used in the wing, and the square of the speed in miles per hour attainable by the aeroplane to give the entire lift of the wing.

There is no one wing curve that will give the best results for every important characteristic of an aeroplane—for example, the speediest aeroplane obtainable cannot use the same wing curve that is required to carry the greatest amount of weight, etc.

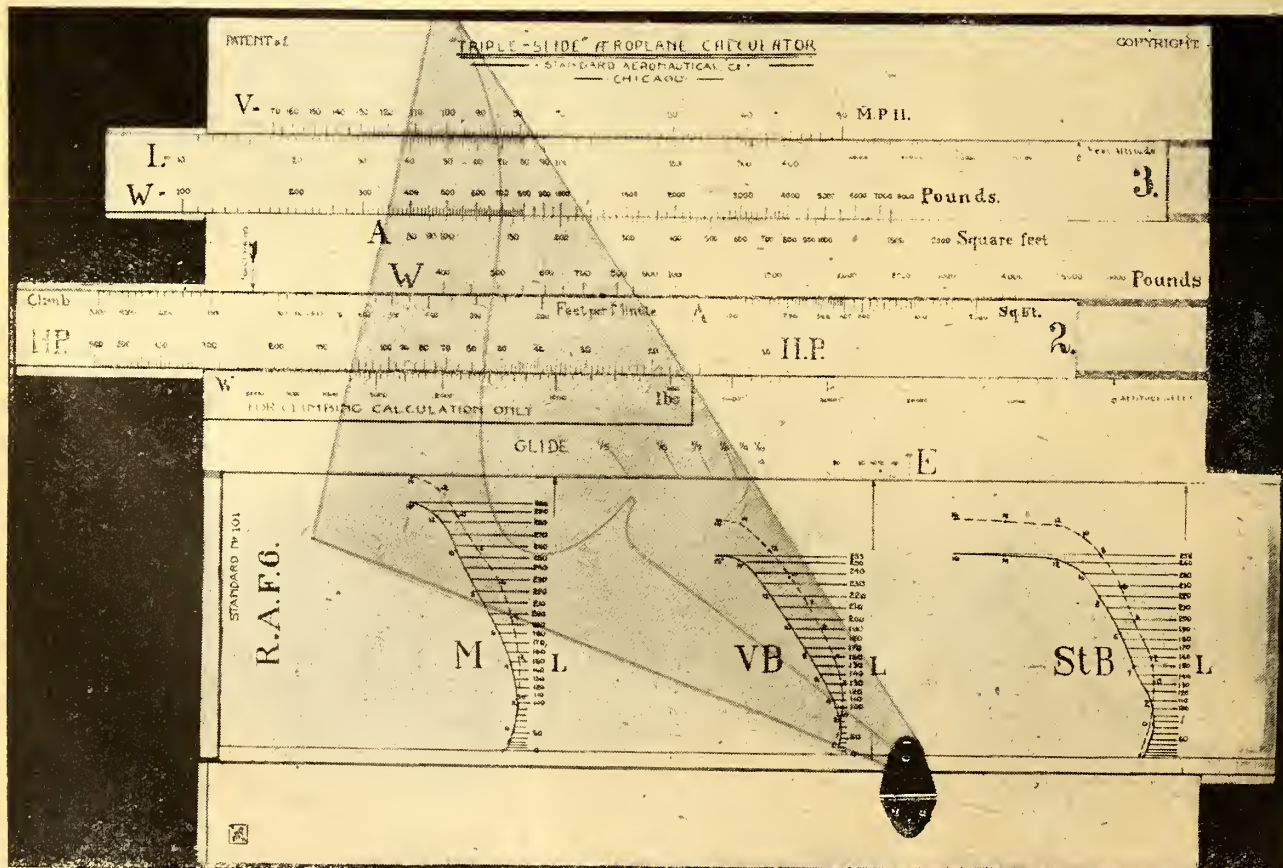
It is impossible to build an aeroplane that will give you the highest aerodynamical efficiency unless you build it according to the lift and drag co-efficient of the wing curve you use. In attempting to build an aeroplane without knowing these co-efficients it is simply a "hit or miss" proposition. It will fly, no doubt, but this is all you can say for it.

We furnish with every "Triple-Slide" the following standard wing curves on slides complete to calculate the monoplane, staggered biplane, and the vertical biplane.

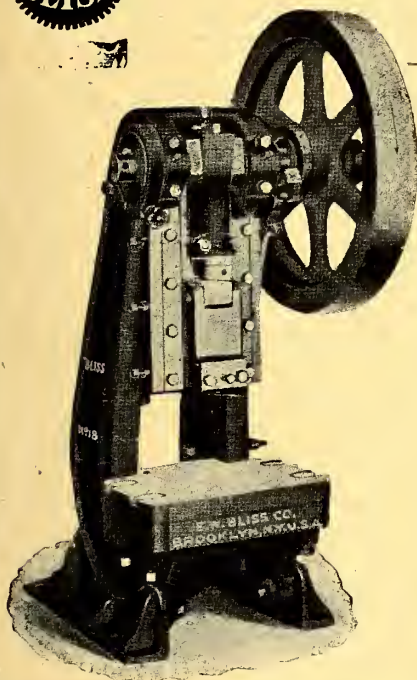
Eiffel test No. 32, or Länier Lawrence wing; Eiffel test No. 35, or Capt. Dorand wing; Eiffel test No. 38, or Coanda wing; R.A.F. 6 wing; Farman wing; Curtiss-Wright wing.

Extra slides of any laboratory tested wing curve can be furnished at \$1.00 each, or any twenty of the most used wing curves at home or abroad for \$15.00.

If you have designed your own wing curve we can furnish the slide with a laboratory test at \$55.00. You would, however, have to furnish us with a 3 in. by 18 in. model section of the wing



General View of the Triple-Slide Calculator.



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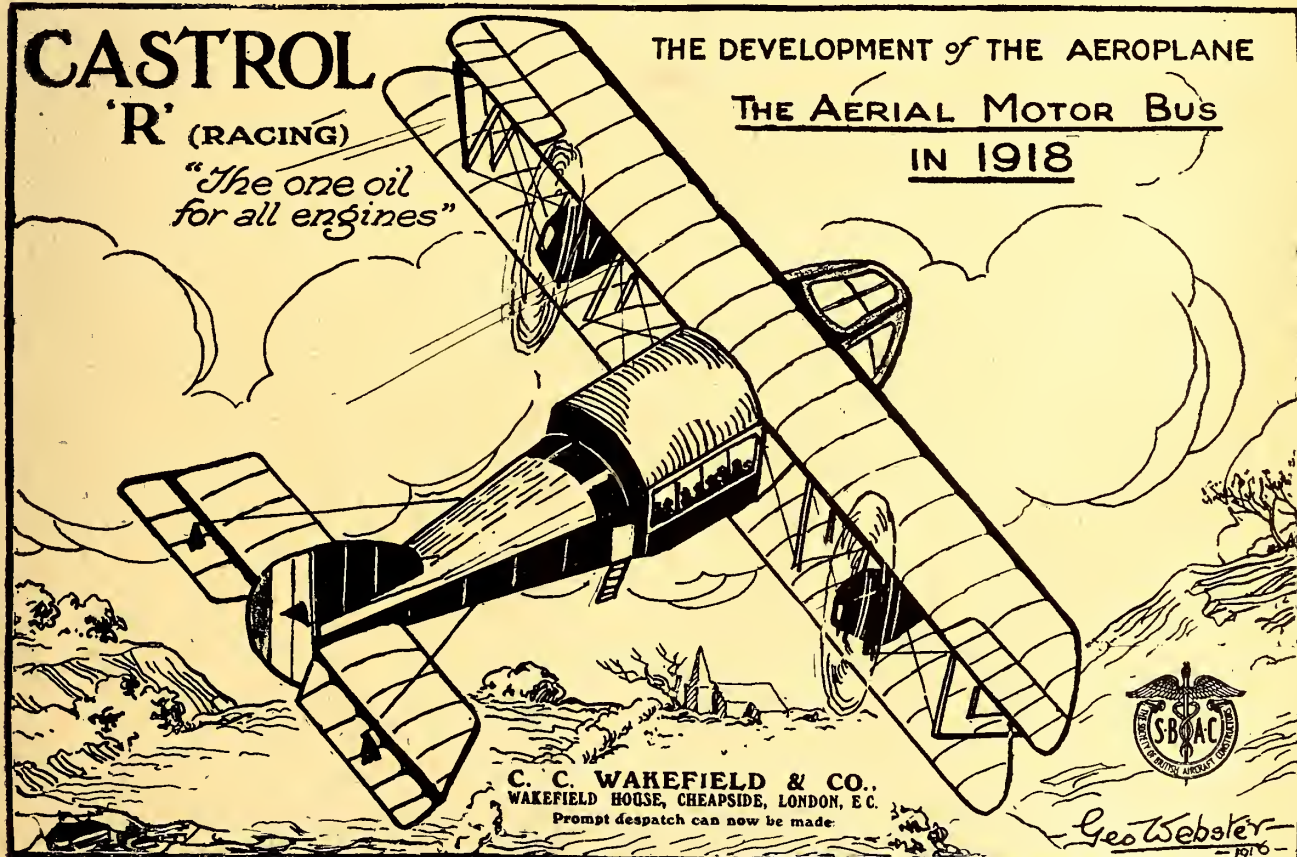
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Geo Webster
— 1916 —

to be tested. If we find your wing to be similar to one of the standard wing curves already tested we will furnish the slide for \$1.00.

We can also furnish a blue print for each wing curve showing the design of the rib, the centre of pressure, the lift and drag coefficient and the effectiveness of the lift and drag.

Although every factor and characteristic is based on the used wing curve it is equally true that vice versa every wing curve is based on the factors and characteristics. It is, therefore, readily seen that we can calculate backwards and forwards from the factors and characteristics to get the best suited wing curve for them.

Having the wing curve which we furnish with our calculator you can calculate every characteristic and the main factors of any aeroplane or any proposed design of aeroplane—for example: Let us take a military tractor with 410 square feet of surface and a construction weight of 1,690 pounds, using a certain wing curve with a 135 horse-power motor. With a few movements of the slide we find that we can carry a useful load of 1,260 pounds. We find that by using a useful load of 960 pounds and a 6 degree angle of incidence we have a minimum horse-power of 54 7/10 at a speed of 65 miles per hour. By changing the angle of incidence to 1 1/2 degrees we find a maximum speed of 103 miles per hour, and a minimum speed of 49 6/10 miles per hour. Climbing speed of 846 feet per minute, landing speed of 49 6/10 miles per hour, the gliding angle to be 1 to 9, the highest altitude obtainable 24,160 feet, at which we have a speed of 85 miles per hour, and we keep on calculating until we have all of the characteristics and the main factors of this aeroplane right before us, and all in a very short length of time.

Your aeroplane cannot accomplish more or greater results than you have calculated with the "Triple-Slide."

AEROPLANE WIRING.

It is apparent to anyone possessing the remotest degree of the faculty of observation that the ordinary aeroplane is to a great extent held together by "wires," which may be ordinary steel wire, twisted wire strands, wire cables and in certain cases streamlined steel rods of the type insisted upon by the Royal Aircraft Factory.

Many people, although they tacitly understand that the use of these wires is to brace the aeroplane together, have never troubled to work out the functions each performs in relation to the others, and to these readers the following elementary explanations are addressed.

The ordinary set of biplane wings is trussed together by wires in its three dimensions, making it into a pure box girder, but owing to the peculiar functions of an aeroplane's wings the different wires employed serve widely different purposes.

The simplest form of biplane wing is that type found in the pusher biplane. The two main spars in the top and bottom planes form the four longitudinal members of the girder. The inter-plane struts form the vertical members and the compression struts which are placed between the front and rear spars, in line with each pair of interplane struts, form the horizontal members.

The nacelle or car of the aeroplane which contains the main loads to be lifted, such as engine, fuel tanks, crew, etc., rests on the bottom plane, to which it is bolted, between the innermost pair of interplane struts, which are placed as closely together as convenient. The inner bay of the girder thus occupied by the nacelle is braced strongly and independently, and may be regarded as solid so far as upward and downward stresses on the main spars are concerned.

It is understood that it is the function of the wings to lift the aeroplane as a whole. Most of the weight is concentrated in the nacelle, and therefore the problem really is how to transmit the lift exerted by the wings to this portion of the aeroplane.

It will be seen from diagram No. 1 that when the machine is progressing through the air, the lift exerted on the wings will endeavour to force them upwards, while the weight in the nacelle tends to force them downwards. The net result is that the wings try to fold up from the tips inwards. The bracing wires shown in heavy lines prevent this however. The upward pull of the

upper spars puts these (lift) wires in tension. The lift on the lower spars puts the inter-plane struts into compression, the top spars being in compression and the lower spars in tension.

This being the case, there should be no load on the opposing diagonal wires when the machine is in the air. They come into play as the machine alights and loses its lift, and are therefore known as landing wires. With the machine resting on the ground the whole position is reversed, the landing wires being in tension and the flying wires slack. The top spars are then in tension and the bottom spars in compression. The inter-plane struts remain in compression all the time.

An aeroplane wing is not merely subjected to the reaction of lift, but also to the reaction of drift. That is to say, the pressure of the air on the machine as it travels through the air reacts in a horizontal sense and tries to fold the wings backwards as well as upwards. Here the horizontal bracing comes into play. The wires, indicated as by heavy lines (known as drift wires) prevent the rear spar from bending backwards, and the compression struts hold the front spar at the correct distance. The opposing diagonal wires (known as anti-drift wires) take the strain if the machine is subjected to a sudden loss of forward way, as for example when landing on rough ground.

The spars are also subjected to a bending moment between each pair of supports, which is at its maximum at the centre point between the supports and runs progressively to zero at the actual points of support.

Many aeroplanes are also fitted with external drift wires running to some point at the front of the machine, and external anti-drift wires running to the rear.

The third dimensional bracing serves to hold the upper and lower planes parallel to one another and in correct relation to the rest of the machine. The change of centre of pressure on the wing curve modifies the relative loads placed on each member of a pair of these wires, which are known as incidence wires.

It should be clearly understood that the strains imposed on the different wires described are merely those of normal flight. Under peculiar circumstances, both in the air and on the ground, the spars, struts, and wires may be called upon to resist strains of a much more complicated nature, so that adequate strength must be given to each member.

For instance, certain lightly loaded, powerful machines have a habit of flying at a slightly negative angle when travelling absolutely at full bore. This in itself places loads in strange places, but when the machine is in the intermediate stage and performs the curious operation of "hunting," further complications ensue which must be guarded against. The study of the manners and customs of the different tension and compression members in an aeroplane's wings cannot receive too close attention.—W. L. W.

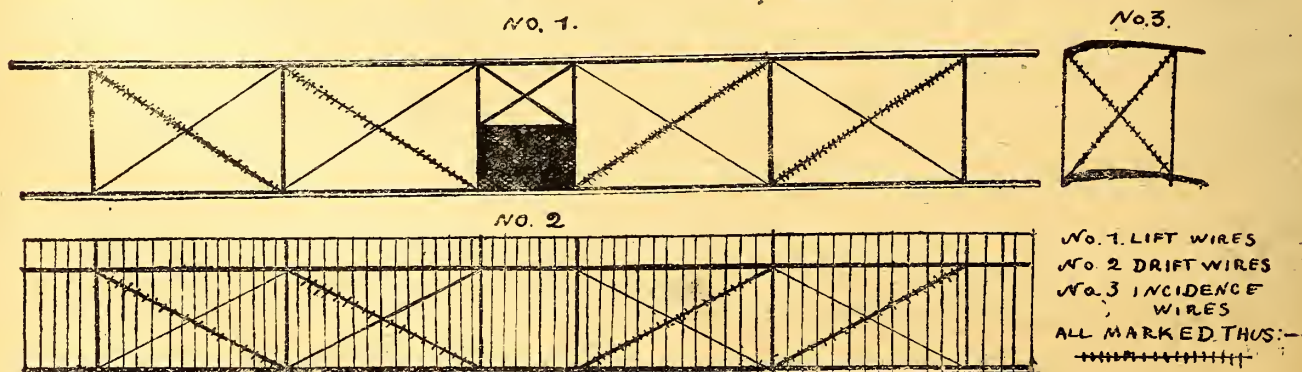
A NEW MAGNETO COMPANY.

A new British enterprise for the manufacture of magnetos has been launched with the issue of a prospectus by the Fellows Magneto Company, Ltd., of Cumberland Avenue, Park Royal, Willesden, London, N.W., for the issue of £75,000 capital. It is intended to manufacture magnetos for Government contracts.

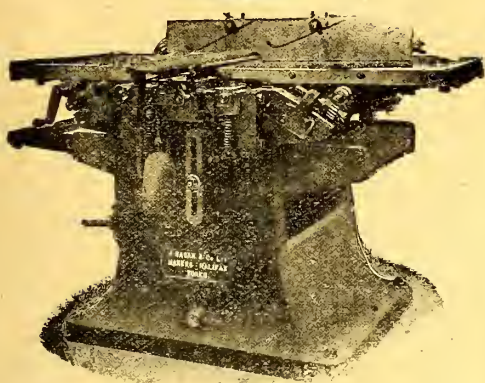
It has already been demonstrated that first-class magnetos can be made in England, and the operations of the new Fellows Company will therefore be watched with interest. This paper recently made known something of the good work done by the firm in the past, and in view of the general determination to keep out German goods in the future, the prospects for a good British magneto are particularly good.

FOUND.

Mr. R. W. Cadogan-Rothery, of 4, Hendon Park Villas, Golders Green, N.W., has found a walking stick with a crest of the R.F.C. and the owner's initials on the top. If the owner of this weapon will communicate with Mr. Cadogan-Rothery he will be pleased to return it.



A Rough Diagram of the Wiring of a Standard Type Biplane.



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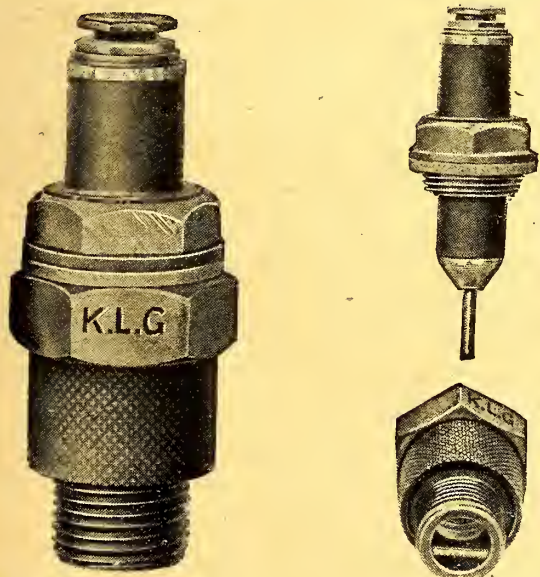
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AN OVERSEAS TRIP.

It is by now well known to everybody concerned with Aviation that every country which has any claim to be a producer of aircraft is experimenting with bigger and bigger aeroplanes. Not very long ago the British Censor actually permitted the publication of the news that a British aeroplane of large size had carried a pilot and twenty full-grown passengers to a height of 7,000 ft., at which height it was still going strong, and was only stopped from going higher by a thick bank of clouds, which made it impossible for the pilot to see where he was going. This record far exceeds anything done by even the four-engined 400 h.p. Russian Sikorski biplane before the war.

Germans, French, and Italians alike have also built very big machines, but so far the Italians are the only one of the belligerent nations who have made a point of emphasising the name of the big bombardment aeroplanes which they use so regularly. These machines, designed and built by the engineer Caproni, were already known to exist in Italy before Italy joined in the war, and were even illustrated in this paper.

They have two bodies, each with a tractor-screw in front, the rear ends of the bodies being connected by one single enormous tail, and in between these two bodies is a short central body like that of an ordinary "pusher" biplane. This also carries an engine, with the propeller behind. It has already been mentioned in print that certain of these machines have been flown from Italy to France for experimental purposes, and, presumably, for comparison with the big French and British bombardment aeroplanes, so it seems harmless and possibly entertaining to give some of the experiences of an officer who, some time ago, flew one of these huge three-engined machines from Italy to France.

He had to start from a certain city in Northern Italy, where Signor Caproni builds the machines, and thence the only way into France is either right over some of the highest of the Alps, or else over smaller Italian mountains near the sea coast, and thence all along the Riviera, which, being chiefly vertical, does not afford any very comforting landing-place for a large aeroplane.

In fact, from the time one leaves Genoa, there is practically no level ground along the coast till one gets to Nice, a matter of well over 100 miles. The Alps Maritimes, over which he had to fly, rise to a height of something like 6,000 ft., and to avoid the violent wind currents which always blow round mountain peaks, more especially in hot countries, 9,000 ft. would be the lowest height at which it was safe for him to fly.

He left his starting point, accompanied by one of his own mechanics, and climbed steadily to a height which one may now state as being over 9,000 ft. without indicating any secret of high military value, and when approaching the mountains he found himself over a sea of clouds which absolutely blotted out the country below him, so that although he knew he must be well above the mountain tops, there was nothing to indicate to him when he had reached them or passed them.

His course at first had to be very much in a southerly direction until he reached the sea, and then he had to turn off somewhere to the westward so as to fly along the sea coast. Consequently, he naturally desired not to overshoot the coast line by too much, as that would mean going out into the open Mediterranean without very much hope of being picked up before the machine sank, if he were forced to come down on the water.

After thus flying blindly over the clouds as long as should have brought him over the mountains he began to look for a gap which would give him a glimpse of the earth, but no gap was visible. Consequently, he held his course for another quarter of an hour so as to make perfectly sure of being well clear of the mountains, even if the wind on the seaward side was against him, and so was delaying his progress.

At the end of his extra quarter of an hour he saw a kind of valley between two cloud-banks and promptly dived into it in the hopes of seeing the ground below, but after diving thus for a couple of thousand feet he merely ran into solid cloud again at the bottom of the valley. Knowing, then, that if he held on he might go so far out to sea that he could not get back, and yet having all the time the uncomfortable feeling that he might still be over the mountains, he dived into the clouds, knowing at the back of his mind all the while that he might fetch up suddenly against a mountain top.

Once in the clouds one loses every sense of direction, just as one does in a thick fog, and although all aeroplanes are fitted with instruments to indicate whether they are flying level or not it is still difficult to keep the machine absolutely level by merely watching the instruments. Consequently he descended in a series of violent steps, at one moment diving at 100 miles an hour or more, and at another pulling the great machine up till she almost came to a standstill in the air and he began to be afraid of her falling over into a side-slip.

In this way he went down till his altimeter showed that he was apparently quite close to the ground, if any, and suddenly he burst through the clouds to find the sea only a 1,000 ft. or so below him. A multitude of white specks on the surface gave him at first the impression that he was very high up over a large fleet of sailing boats, but he soon perceived that these were the white tips of waves stirred up by a very stiff breeze blowing in the same direction as that in which he was going.

It took him a few moments to size all this up, and by the time he had done so, and had pulled the huge machine back from a diving position into her ordinary flying attitude, he was only 30 or 40 feet off the surface of the water, and there was no sign of land.

He realised that he had overshot his calculations very greatly, owing to the fact that after he had crossed the mountains he had run into a very strong wind blowing from the mountains straight out to sea, and he calculated roughly that at the speed at which he was travelling over the water he must be anything between 50 and 100 miles from the coast. As soon as he found what had happened he turned up north and started to fly in what he knew must be the direction of the French coast, and at this particular moment the left-hand engine chose to break a petrol pipe. There was considerable popping and banging from the motor, just as a car-motor pops when it has run out of petrol, and, looking to the left, he saw a stream of petrol being blown back by the propeller all over that side of the machine. Hoping that none of it would be blown into the centre "pusher" engine, and so set the machine on fire, he turned off the petrol supply from the left-hand tank, and sat down to do the best he could with the other two.

Now, if one wants to fly with two engines on a three-engine machine, one stops the central engine so as to have a level pull with the other two, but, in this case, there was no choice, so he had to fly with the right-hand engine doing its best to pull the machine round in a circle to the left, which meant keeping the rudder bar over against it all the time. Already, both he and the mechanic were pretty well deafened by the roar of the three great engines with open exhaust pipes, so it was quite impossible for him to give verbal instructions to his mechanic, but, fortunately, the mechanic was an intelligent chap, and after sundry prods in the ribs from the officer's elbow, he comprehended what was required of him, and set himself to assist the pilot by putting his feet on the right-hand side of the rudder bar alongside of the pilot's right foot.

After flying in this uncomfortable fashion for half an hour or so, they sighted the coast again, but when they got close to it they found that there was such a wind blowing over the mountains that when they turned to fly parallel to the coast the gusts striking the machine on the right-hand side made it almost uncontrollable. Consequently, they had to come down to within a few hundred feet of the water so as to be sheltered as much as possible by the mountains.

Holding the rudder hard over to the right as they were, every time a strong gust hit the machine she headed over to the right and up went the left wing. Then they would ease off the pressure on the right-hand side of the rudder-bar and fetch her round again to the left. Several times in doing so gusts got them under the right-hand wing while they were still turning, and almost fetched them down with a left-hand side-slip; but, fortunately, the pilot, being a man of great skill and experience, always managed to get the machine back to a level keel before she actually struck.

In this uncomfortable way, rolling from side to side, and continually yawing off their course, they progressed along the Riviera, and finally fetched up pretty well worn out at Nice, but it is to the pilot's credit that, tired as he was, and awkward as the machine was to handle with her lop-sided drive, he made an absolutely faultless landing. Both he and the mechanic were deaf and speechless for quite a considerable period after they landed, but they recovered completely by the next day, and eventually completed their journey to "somewhere in France" farther north.

Despite all their discomforts they had an excellent object-lesson in the utility of three engines, for if this had been a single-engined machine under similar circumstances a broken petrol pipe would have meant coming down in the water and disappearing for ever from human ken, and even with a two-engined machine it is doubtful whether one engine would have kept the machine aloft.

But this particular officer says that he has no particular ambition to fly a big machine again broadside on to mountain air currents with all his engine-power on one side.—C. G. G.

ADVICE TO THE INDUSTRY.

A recent issue of a so-called aviation paper expresses some interesting opinions as to the way in which modern aeroplanes should be constructed, and one or two extracts are given in order to ensure that everyone in the Trade may benefit from the gems of wisdom set forth therein.

Propeller makers should note that, according to this contemporary, the best factories make their air-screws to a "thousandth of an inch accuracy." Doubtless each workman is furnished with a barometer, and a maximum and minimum thermometer to make the necessary corrections for deviations from standard temperature and pressure.

Further on in the article the propeller maker is told that the thickness of the boss, "into which the blades are inserted," is another all-important item, and has to be of equal accuracy with the other constituents of this part of the mechanism.

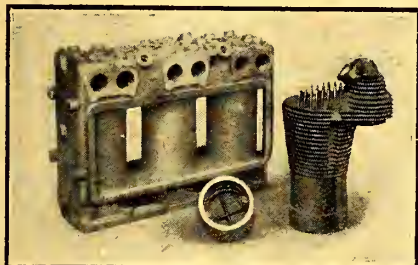
One assumes that unless the boss is of sufficient quality it is impossible to guarantee that the threads on the ends of the blades will not become unscrewed half a turn, and thus drive the aeroplane backwards through the air!

Aeroplane designers are assured that the lifting capacity of an aeroplane is mainly centred in the revolutions of the propeller

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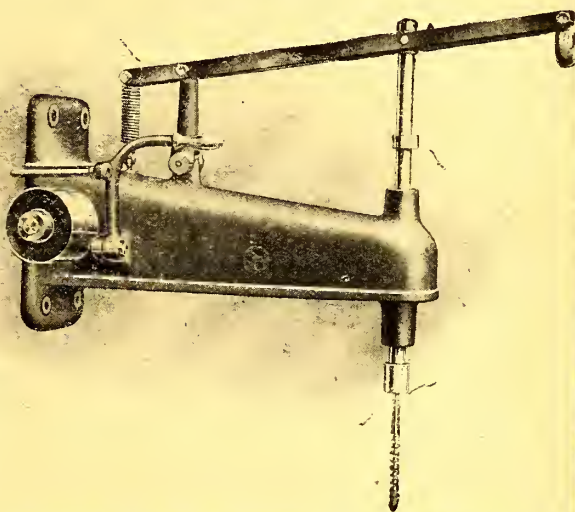
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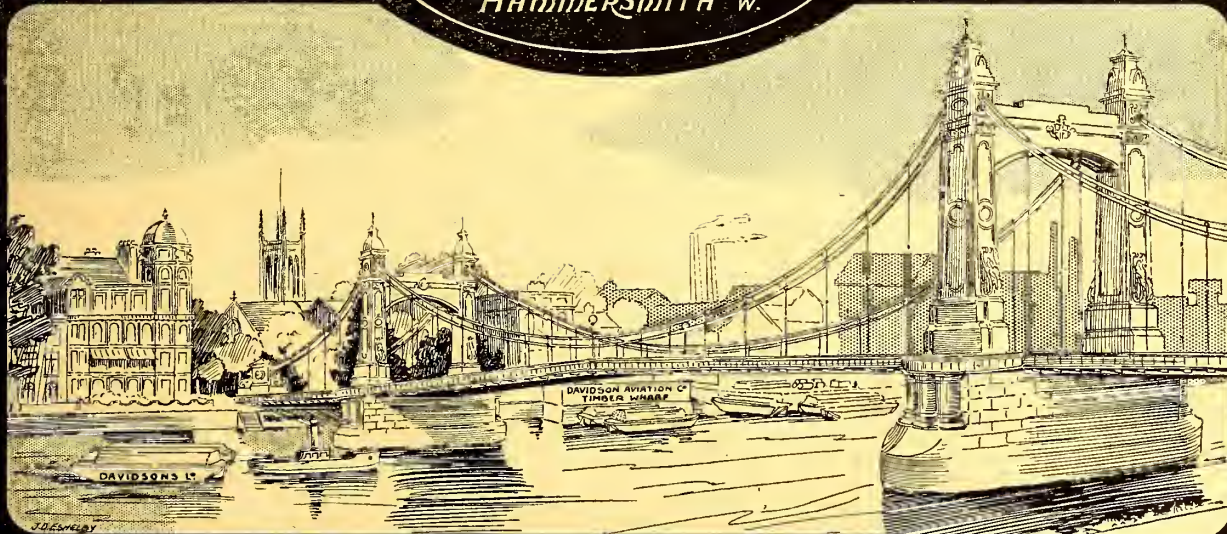
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through air displacement. Of course every aeroplane designer fully appreciates this point, and, if pressed, would confess that the wings of the machine are merely fitted to humour his fancy, and to protect the rubber tyres and the pilot's head from the sun!

Another article suggests that in the best-regulated aeroplane factories the fabric is first doped and then fitted to the machine! The more calculating mind might consider this method wasteful, as it would have the result of doping the superfluous fabric which has to be trimmed off the wings, apart from the minor difficulty of getting the fabric taut after fitting in this quaint state, but, of course, in war time munitions of all kinds have to be produced regardless of expense.

An article which gives kindly hints to embryo aviators uses some technical terms rather bewildering to the novice without adequate explanation. For instance, the writer states that the first *faux pas* of an aviation pupil is committed with the "joy-stick." For some reason best known to himself, the writer forbears to give an adequate definition of this instrument.

The Royal Flying Corps will be gratified to know, *vide* this amusing contemporary, that at the present time they possess "tens of thousands" of pilots, with a corresponding number of mechanics! Probably before long the word will go round that it is the intention of the R.F.C. to organise a private Expeditionary Force of its own to finish the war in Central Germany!

The proprietors of the aforesaid contemporary ask for helpful suggestions to increase the utility of their product. Perhaps some of our readers could go to their rescue. Meantime one may suggest that if its staff learned something about aircraft it might prove helpful.

AN EASY STARTING DEVICE.

Gunspray, Ltd., 39, St. James Street, S.W., have placed upon the market a device for ensuring the easy starting of car engines, which seems as if it would be adaptable to stationary aero-engines. In starting up a big engine with many cylinders, and usually a complicated inlet manifold system, the chief difficulty is to ensure sufficient suction to draw the appropriate amount of petrol from the carburettor jets and to give the vapour sufficient velocity for it to get into the engine with the necessary richness.

The Gunspray starter consists of a reservoir of petrol which can be filled from the main tank with the aid of a length of piping and a tap. Into this reservoir dips a tube which extends into a jet leading straight into the inlet manifold, where it emerges in the form of a fine spray. The device is screwed into the side of the inlet manifold, and the suction of the pistons draws the petrol from the reservoir out through the jet, where it mixes with the air which has entered the manifold through the opening G, the proportion of air being varied according to requirements by the adjusting and locking screws I, J. It is claimed that the starter will start any car engine from cold with half a turn of the crank, and that it is possible to continue to run the engine through the starter so long as the reservoir contains any petrol, so that if necessary a car motor can be run on

EXPLANATION TO DIAGRAM.

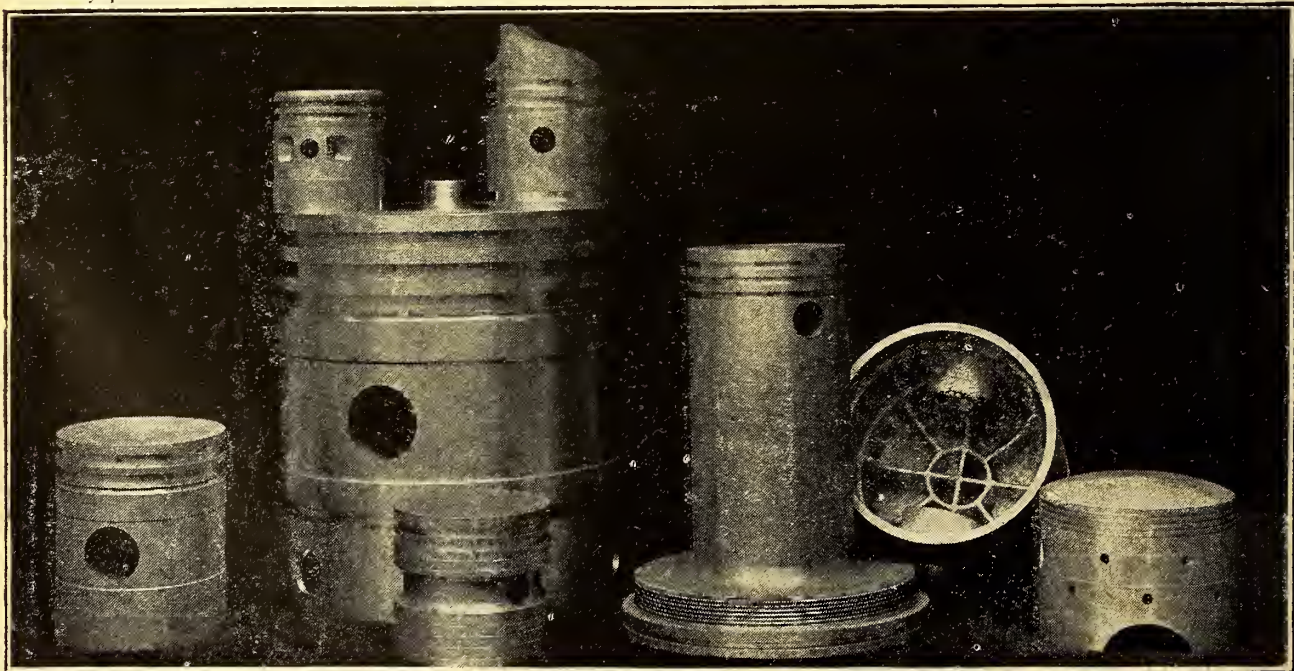
Fig. 1.

-
- a. Reservoir
 - b. Gauze cap for fuel tube.
 - c. Fuel tube.
 - d. Connecting fuel tube.
 - e. Mixing chamber.
 - f. Spray jet
 - g. Air inlet for vaporising
 - h. Air distribution to reservoir
Atmospheric pressure
 - i. Controlling screw for amount of air required.
 - j. Locking screw.
 - k. Control wheel.
 - l. Union connecting supply pipe to tank.

the petrol in the reservoir until it is sufficiently hot to vaporise heavy fuel.

A lever for controlling the starter is fitted to the dashboard of the car, and as the air-way through the starter can be controlled when the actual starting jet is out of action it can also be used as an extra air inlet when required, the use of which has been found to result in considerable economy in fuel.

The price of the Gunspray easy starter is £5 5s., including the cost of fitting, so that it is very much cheaper than the ordinary electric self-starter, and of course it scores in that no electric self-starter will work if the correct mixture is not supplied by the carburettor to the cylinders.



The pistons illustrated are the work of the Aluminium Alloy Pistons Co., of 6, Great Marlborough Street, W. They are all for internal combustion engines of one sort and another, and some are for special purposes. The castings are extremely clean jobs, and the machining is also well done. Naturally, the pistons are all made of a special aluminium alloy. The makers are prepared to undertake work of a similar nature to any specification, and cordially invite inquiries, as they have facilities for turning out pistons, both in small and large numbers, and to small or large sizes.

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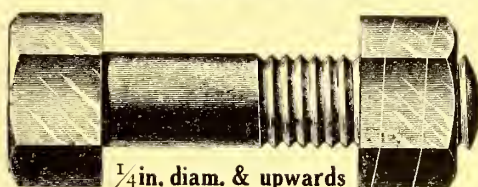
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Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

AND THE STARTING DEVICES.

As to starting, there are three methods available in the Renault scheme. One is the old man-handling propeller struggle, which very properly does not commend itself to S.C.s. in charge of keen, but slight-built pilots who might get shy of their geography. The second way is by means of a geared starting crank from the tail of the crank-shaft, in conjunction with a fifth magneto geared to turn ten times faster than the motor.

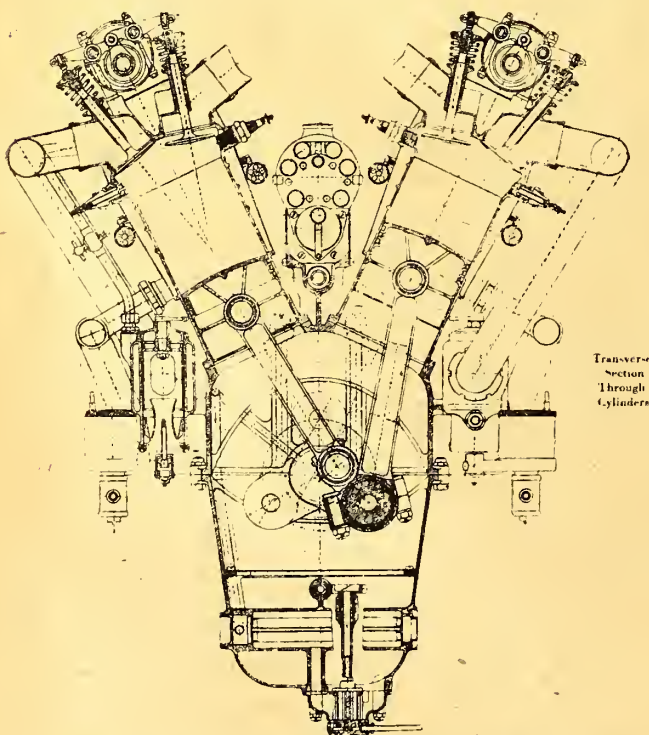
This auxiliary produces two sparks at a time; that is to say, forty-eight sparks for every two completed revolutions: its high tension wire being connected in a serial circuit with the distributors of the four working magnetos. But as its gear runs off the pawl-and-ratchet gear of the starting device it naturally goes dead as soon as the motor has started.

The same device is used in connection with the third method, that of a compressed air starter or servomoteur devised somewhat on the lines of the starter which the Billancourt firm tried to introduce some years ago for their cars, but elaborated into a kind of radial motor, fed with compressed air from a container bomb. Its cylinders, which are of aluminium, are cast integrally with its crank-chamber; the pistons being leather-lined, and the connecting rods attached by pins to the drum of a single crank.

On this crank is geared a rotating distributor, with six portholes connecting each with its respective cylinder by a transfer duct drilled in its wall.

The distributor is further connected direct with the compressed air supply: so it will be readily seen that the rotation of the distributor—which is halved into an inner and an outer chamber—feeds each cylinder in turn, and receives its exhaust through the same radial channel into the second chamber, which is open to the atmosphere. And the crank of the *servomoteur*, having a ratchet gripped by three pawls contained in a box coupled to the end of the motor crank shaft, it will be also seen that as soon as the *servomoteur* crank is rotated, the distribution of the compressed air is sufficient to take the motor shaft through a few rapid turns with the auxiliary magnets peppering its sparks in all the while. So that it should start, with average luck, when the pilot, of course, stops the distribution of air, and the pawls free-wheel on the *servomoteur's* ratchet.

The container bomb holds compressed air enough for ten startings. Only, luck of this kind is not a thing to gamble an aeroplane and its mission upon. You may easily have motor trouble, and run through all your allowances before you detect and cure it. And then? Or you may readily forget whether you are at your seventh, eight, or ninth allowance. *Che altro?* So, on the whole—as these were precisely the experiences which outed the compressed air starter idea of eight or nine years ago—it is better to trust to plain gear-starting appropriately proportioned to your strength.



Sectional end view of 200-h.p. Renault-Mercédès Engine.

OLD DAYS AND NEW NEEDS.

Although history signally fails to affect results, it may still be useful to record developments, and thereby give us our second chance. Everybody knows that—provisionally for M. Georges Prade and others—motor-boat racing preceded aviation. The more important development was that it taught us how to begin to learn to build absolutely trustworthy motors. But not all of us. For everybody may not have noticed the chiefly significant fact, that not only did the Germans, despite their vaunted science and skill, fail to win a single race of any importance, but that the final international issue was left to America and ourselves, even the French being hopelessly out-distanced.

With positively no limit—except over-all length—we had 600 h.p. in one hull hurtling alongside 600 h.p. in another hull at any speed up to 45 knots. And afterwards, apparently nothing; at least, for the time being. You cannot change a million-pound note into ready money. Nobody wants it.

Then—again provisionally for the French newspaper and wine trades—aviation burst into being at Reims. Thereafter, up to 1914, its history—especially as to its motor aspect—reduces to this, that the French had the very goods, and the Germans took care to get them as far as they could, while we had to make the best of such scraps and leavings as we could pick up.

But now the wheel of war has swung round to the 500 h.p. mark. We hear of Panhard's of that power, in experiment, but we do not see them in use yet. We have heard of no Delahaye or Peugeot production whatsoever: and of Renault only to 250 h.p. Which likewise—if we may judge from wreckage-examples—seems to be the German limit.

POSSIBILITIES—AND A NEW MODEL.

On the other hand, amongst ourselves, there exists at least one type that could be built to-morrow up to 1,000 h.p. and more, from the same cylinders—with nothing further of a physical or mechanical kind to be learnt—as the four which already have given a full 300 h.p. on 3 lbs. per h.p.: and all that 1,000 h.p. within a six-foot length. We also have probably half-a-dozen other makes that could be built up to 500 or 600 h.p. within the same compass. This being our particular war, one may not define further; but there is no harm in stating that in the U.S. the 250-300 h.p. mark has also been passed in as many cases.

One of the latest of these—and the more interesting because of its motor-boat racing genesis—is the new 300 h.p. twelve cylinder V-type model recently built by the Duesenberg Motor Company of Chicago: which is a refinement, without any change in the design, of the model that Mr. F. S. Duesenberg produced just before the war for "Disturber IV." What the pair of motors of this model did, when installed in this boat—the speediest yet built in America—is history of a kind hardly obscured by the war. The wonder is that the design has been withheld so long from aerial use.

SOME OF ITS QUALITIES.

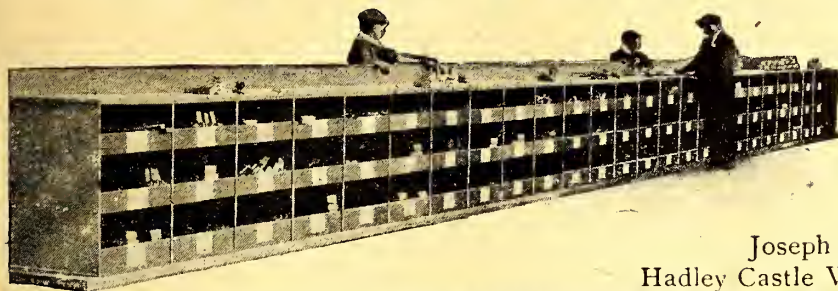
For its chief merit is not so much absolute originality—for Delage in France had a similar valve-setting, and Professor Lanchester has produced both valve-setting and valve-gear practically the same—as that while nevertheless rare in detail-practice, it eliminates almost every tangible defect—from an aviation standpoint—of conventional four-stroke V-type design, while retaining every advantage of that type. So, since there would be apparently no matter of patents to hinder, it is one that can be strongly recommended for adoption, either by experiment or direct arrangement.

Furthermore—to cite results beforehand, the better to appreciate the means—the Duesenberg aeromotor develops its 300 h.p. on a total weight, including the electric starting-gear, of 1,040 lbs.; which at 1,400 r.p.m. only, represents less than $3\frac{1}{2}$ lbs. per h.p. This, let the claims of artificially-lightened motors be what they may, is an extraordinary, if not unique achievement for any four-stroker; in fact the 300-1,000 h.p. possibility aforesaid—a two-stroker—only just beats it. But as a very large propeller is needed to hold the Duesenberg down to even 1,400 r.p.m., one may well infer, not only that it is designed for very huge aeroplanes, but that at 2,000 r.p.m. or so, with a reduction gear, it holds an easy probability of some 500 h.p. at a little over 2 lbs. per rendered horse-power.

Coming now to the mass-aspect of the design, one gets the main outlines when it is said that the twelve cylinders—of which the bore and stroke are $4\frac{1}{2}$ inches and 7 inches respectively—are cast in pairs out of mild steel; and that they probably weigh only 51 lbs. the pair because they are cast open for the lightest of applied panel water-jacketing. Also that the whole of the valve-gear—on the inner side of the 60 degree V—is housed in three V-shaped aluminium covers, one to each group of two cylinders and its opposite pair. This detail is said to stiffen the construction; which it cannot do for a moment, the covers being detachable and only lightly secured. On the other hand, it imparts an

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extremely neat and clean finish to the construction; and—since to us in this country at least one process is available, whereby aluminium can be hardened to steel toughness—it might readily serve to armour the vital and vulnerable element of the valve-gearing.

CONCERNING GAS-ENGINE PRACTICE.

With which, of course, we have also—as in any other four-stroke motor, but particularly in this case—the very essence of the design. Now we can never get away wholly from the physico-mechanical results long ago established in gas-engine practice. Every departure therefrom, however slight, may be a concession to convenience, but it is just as certainly a contribution to inefficiency. We have, of course the very excellent theoretical ideal of the dome-shaped combustion chamber and its inherently involved practical difficulties of valve-arrangement, fitment, and detachability. On the other hand we have every pocketing departure from the trefoil-head of Panhard to the hammer-head of Mors, with all other extremes or compromises of French or Teutonic motor car practice and their British imitations. All of which have soon found their limits in mileage and consumption; and their own condemnation therewith.

Gas-engine practice, on the contrary, insisted that the combustion and compression chamber should not only be the sole insertion place for the valves, but that it should be distinct from the working cylinder though freely open to it. Going to the other i.e. extreme, Diesel motor practice in its most successful examples, has only confirmed the truth of these conclusions the more emphatically.

Yet with us, only the original Wolseley design—merely defective because of insufficient water-jacketing about the heads, and a certain shortness of stroke—and in France, only the Gobron-Brillié, adhered to these gas-engine principles and such valve arrangement as they might involve.

SOME OF ITS RESULTS.

Thus went convention: until one day Lanchester produced a car which—chiefly by virtue of its motor—is probably the most economical thing on wheels to-day; and until Delage, three years later, designed an automobile motor with which he won the Coupe de l'Auto against all the best that convention or originality, skill or freakishness, could find. That Bablot had something wholly different in front of him could easily be told from the bark of his exhaust above the bellow of Boillot's, as they hurtled in from Bainethun every round of that last memorable seven. No less significant was it that he finished with some ten litres in hand above his petrol allowance.

Still, not more than three people beside the measurement committee saw that winning motor taken down; so any special details of its design and their significance were doubtless soon forgotten. Nobody from the Midlands was present, at any rate; which probably explains the latest compliment to the Peugeot design of that date. But there, fundamentally separate above each piston-filled cylinder was the narrow drum-like combustion chamber, with its horizontally inserted valves, inlet opposite exhaust; and both heavily water-jacketed, which last point is one of the essential

features of this type of practice. They happened to be operated by long-sleeved bell-cranks and tappets, just as the Lanchester design happens to use long vertical rocking-beams pivoted on the cylinder casting, direct from cam to valve-tail.

THE DUESENBURG WAY.

Yet Duesenburg has managed to do the same thing with an original difference of distinct value for the special purposes of an aeromotor. Now with valves opposed horizontally in the Lanchester-Delage manner, it is obvious that unless the seating of at least one of them is detachable neither can be inserted, let alone detached. So, apart from any general physical reasons for adopting this style of combustion chamber, the Chicago designer probably saw that it possessed the peculiar mechanical advantage—already noted in the horizontally opposed Acle-Werry design, merely a variation of the same gas-engine practice—of an available valve-area larger than any conventional model can offer. With this margin—in which every fraction of an inch tells—in hand, he could afford to make that original difference, and mount each pair of valves side by side, on the inner side of the cylinder and V-group.

Consequently, and with further advantage from an aeromotor standpoint, not only could he fit a large breech-block type of cover opposite each valve, enabling it to be easily detached and replaced without dismounting any other part, but every valve of the twenty-four could be operated from a single cam-shaft in the most approved manner. Furthermore, to save the not inconsiderable power lost in overcoming tappet-rod weight, he could at the same time adopt the Lanchester fashion of long rocking-levers to operate the valves.

AND HOW IT WORKS OUT.

All of which—as the illustration shows—he did: incidentally avoiding the alleged defect of horizontal valves, that they seat unevenly, from the fact that the V-mounting of the cylinders gave the valve-stems an actual angle of some 55 degrees from the vertical; quite enough to enable them to work around their seatings.

Particularly too, will it be seen that not only does this gas-engine type of combustion-chamber and its consequent valve-mounting favour the cooling of the valve-seatings and valve-stems to a singular degree, but that it makes for a more direct induction and exhaust than any other modelling—at least in four-stroke practice—can possibly afford. Again the consequent overhead distribution of the mixture enables it to fall in by its own weight as much as by piston-suction, and so ensures full charges: which being compressed as they are to the very crowns of the cylinder have positive and live areas to butt against. Finally—which is no slight advantage—while the spark-plug's insertion is such that it fires as directly into the compressed charge as in any other possible design, it will be seen that no other shape of combustion chamber could so effectively pocket it, immune from fouling with cylinder-oil, burnt or not.

Nevertheless, the apparent defect of one of the finest V-type designs in existence is this, that however readily detachable the valves, the seatings thereof are integral with the cylinder casting.

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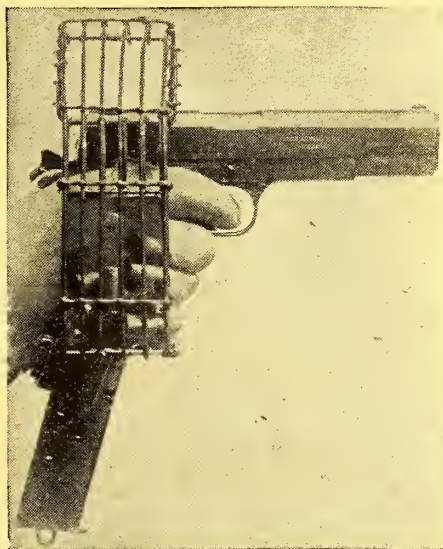
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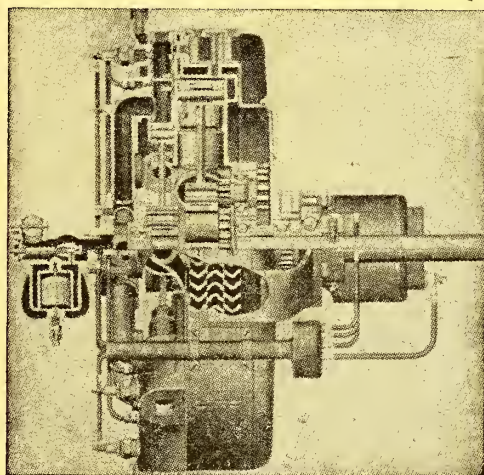
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(To be continued.)

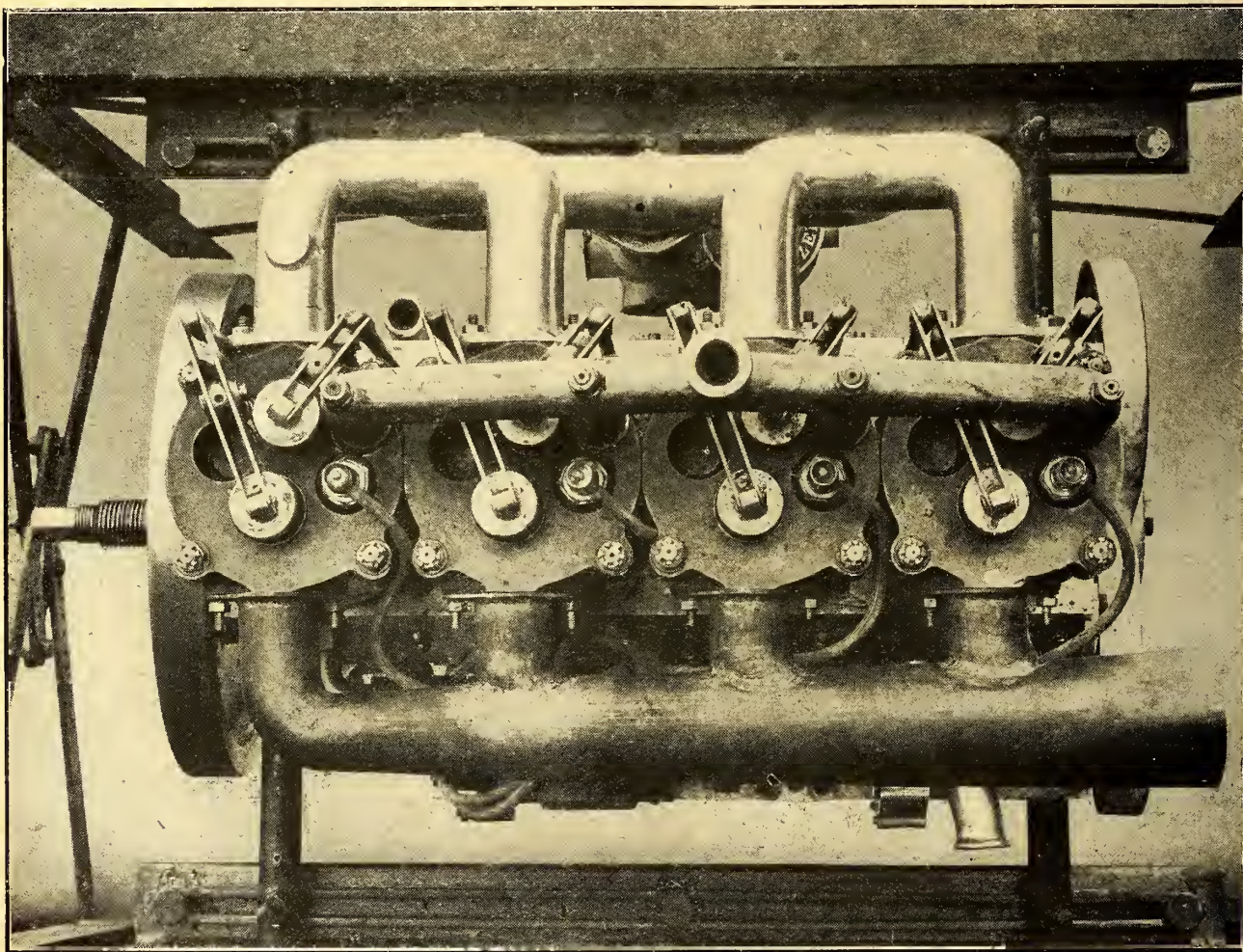
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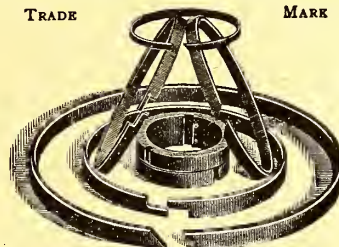
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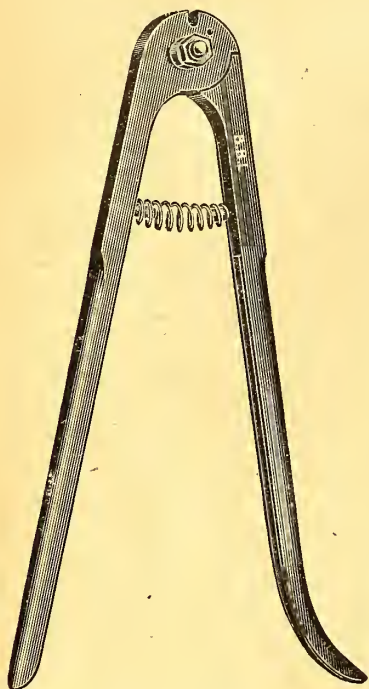
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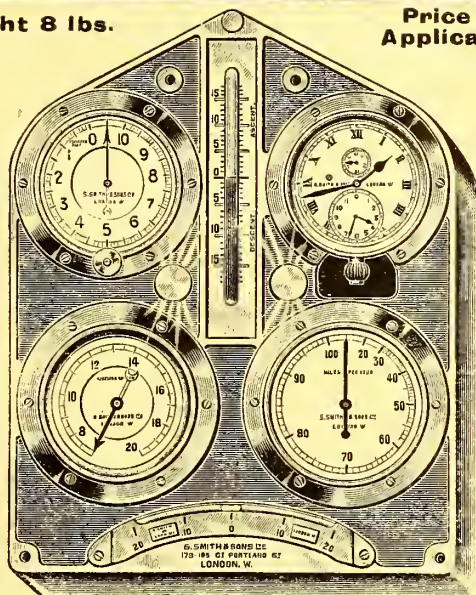
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ON THE DISTRESSFUL AIR SERVICE.

Somehow or another this eternal argument as to whether there is to be an independent Air Service, with an Air Ministry of its very own, reminds one of the Home Rule question. Properly governed by a strong man who knew his job, either Ireland or the Air Service might be able to run itself satisfactorily, and, weakly or ignorantly managed, either would certainly come to grief. Also, to ensure success, either would have to recognise the fact that it could not exist independently of its Senior Partners.

Some humorist has said: "When the Almighty created the world, He made one monumental mistake. He ought to have put the Dutch in Ireland and the Irish in Holland. The Dutch, with their unflagging industry, would have made Ireland the garden of the world, and the Irish would have been so damned lazy and quarrelsome that they would never have repaired the dykes, and they would all have been drowned."

Barring the slight anachronism that the Dutch dykes did not exist till some time after the sixth day of the Creation, there is something in the philosophy of the idea. And the Air Service problem is not dissimilar.

If the Almighty of the Government had put the Naval Air Service originally in the hands of a number of serious-minded Naval officers, gunnery jacks for choice, to do the thinking, and had given to them a sufficiency of engineers and disciplinary watch keepers to do the work, and if the R.F.C. had been put entirely in the hands of gunner officers, with some sappers to dig aerodromes and drains, and cavalymen to manufacture pilots, things might have been different. As it was, both Services fell more or less into the hands of politicians and pirates—just like Ireland. And if the politicians and pirates had been kept in the Regular Services, they would by now either have been cashiered, or would have been killed gloriously in the face of the enemy.

At present, thanks to the dominance of gunner ability, plus the hard and loyal work of other officers of the right quality, the R.F.C. has attained to a position not unlike that of Ulster in the Irish question. That is to say, it has no desire for Home Rule, and it is quite a success at its own business—barring that nothing on earth, even when in the air, can be perfect, and there is still room for improvement in detail.

The R.N.A.S., on the other hand, strongly resembles the rest of Ireland. A minority of its officers are wholly loyal to the Navy as such, and have no desire to be anything except Naval officers. A small number of that minority are thoroughly fed up with their present positions, and only want to get out and back to the Navy, just as some inhabitants of Ireland want to get back to civilisation in England: the rest of the minority want to be Naval officers on air service.

Of the majority, some do not care what they are so long as they can attain their personal ambitions, either as public idols or as financial successes—like some Irish

politicians. Others frankly want to get quit of Admiralty mis-rule and Balfourian futility—I beg the gentleman's pardon if that is the wrong word; perhaps I should have said philosophy. This section contains within itself parties similar to the moderate Redmondites and the extreme Sinn Feiners, both equally determined in their own way to be independent.

Others again simply do not care, and so long as they are allowed to do their jobs properly they are indifferent as to whether they are *pukka* Navy or independent Air Service. They resemble certain worthy citizens of the town of Enniscorthy during the recent rebellion, who, when troops arrived and occupied the Show Ground, and thus dominated the Castle, which was occupied by the rebels, formed themselves into a "Neutral Committee" and went out to negotiate with the troops. The idea of a citizen being neutral during a civil war or rebellion may seem comic to an Englishman who can only conceive that a man must be either loyal or disloyal, but the position is thoroughly Irish and logical. These people, like the similarly placed R.N.A.S. officers, are quite prepared to do their best under whichever party comes out on top at the finish.

The parallel is singularly complete when one works it out, and the solution is almost as evident in each case—namely, that the Independent Service, or Home Rule Party, should be made independent and placed under the sole control of a strong disciplinarian belonging to that party. The remedy is being tried in Ireland, for it was announced last week that Martial Law is to be administered there in future by a Catholic Irishman, Sir Bryan Mahon—a course, curiously enough, suggested in this paper two or three weeks ago.

If Sir Bryan is still the same strong man he was when in India, and if he brings Ireland to the state of efficiency to which he brought the first Irish Division before it was broken up and destroyed in detail by the incompetence of people above him, it will be the finest thing in the world for Ireland—and one will be willing to overlook the fact that he once relieved a place called Mafeking.

Similarly, if the un-Naval part of the R.N.A.S. is put under the command of a stern, strong disciplinarian, who has the imagination also to make it an active striking force, it may yet fulfil a useful place in the world. If that is not to be done, then the best thing will be to hand over all the un-Naval part to the R.F.C. and watch what military discipline will do.

THE R.N.A.S. AND ITS WAYS.

If this were done, the residue of purely Naval pilots would be fairly small, for it is quite remarkable how much energy the R.N.A.S. has wasted on the wholly illegitimate job of producing land machines and pilots, and how little it has expended on its proper job of sea work. Probably the reason is that in the early days of the war the R.N.A.S. won quite a good deal of kudos

very easily by overland raids, such as those on Düsseldorf and Friedrichshafen. I do not mean that the raids were easy for those who took part in them, though they were certainly easier than the seaplane raid on Cuxhaven, but I do mean that the whole R.N.A.S. got very much too much advertisement out of things that were of little or no importance to the war.

Possibly the ease with which shore-going aeroplanes can be built and dispatched on raids moved those in power to devote more attention to this class of work, in the hope of getting still more advertisement out of it, but the policy was wholly and absolutely wrong, and the policy was feebly carried out even at that. The Friedrichshafen raid was excellently organised, and there was absolutely no reason why such raids should not have been made once a week ever since, with more serious results to the enemy every time. And similar raids over other important areas might have been made with equal regularity elsewhere, but for some curious reason no progress has been made in this direction.

The German official communiqué recently reported the capture of some British Naval aviators in the raid on Oberndorf, so one assumes that they started from somewhere in Eastern France. The Admiralty has been unusually reticent about the affair, and the French account gives the total number of machines used, French and British, as only 40, so one is obliged to deduce that this detachment is very small, or else that the expedition is what is commonly termed a "wash-out," owing possibly to mis-organisation. In either case, the R.N.A.S. authorities seem to have very little to be proud about.

It is an ill wind that blows nobody any good, so it must be confessed that the R.F.C. has to thank the R.N.A.S. to some extent for the existence of some of its best aeroplanes—though not for its best engines, as some people would have us believe. The people to thank for them are the manufacturers who struggled along and produced the right thing, despite official discouragement, indifference, or meddlesomeness, as the case might be.

Also, the Army on its flat feet may thank the shore-going R.N.A.S. for useful help in Flanders, the Eastern Mediterranean, and Mesopotamia, where R.F.C. machines could not be had, or were useless for their job. Nevertheless, all this had nothing whatever to do with the job of the R.N.A.S. as such, which is to co-operate with the Fleet.

One may acknowledge that it was a trifle hard to induce the Fleet to co-operate with the R.N.A.S., partly owing to the innate conservatism of the bred and trained sailor, and partly because of the omission of the R.N.A.S. to endear itself to the Senior Service. One can sympathise with R.N.A.S. pilots flying up and down a heavily armed coast over continuous fire, busily trying to cor-

rect the fire of ships which steadfastly refused to be corrected. And one can understand their annoyance on discovering that the ships preferred to take their spotting by signal from a tower ashore, whence the observer could barely see their target and could not see at all the fall of their shell. And one can even forgive the seaplane wireless operator who plaintively asked *en clair*, "Why does the 'Aggy' persist in firing short?"

WHY THE ESTRANGEMENT.

But someone somewhere is heavily to blame for not insisting from the beginning in closer co-operation between the R.N.A.S. and the Navy proper. Probably the estrangement, or rather the lack of cohesion, arose from the fact that, instead of starting its existence as a subsidiary Naval Service, like submarines, the R.N.A.S. came into being merely as the Naval Wing of Colonel Seely's idiotic scheme for a single Flying Corps for both Services.

If their Lordships of the Admiralty had put their feet down there and then, and had said that this thing was the Navy's job and the Navy would see to it, things would certainly have been different, but the Powers that Were at that time took so little interest in aviation that the first four officers to fly by kind permission of the Admiralty only learned through the private charity of Mr. Frank McClean, who lent them his own machines for the purpose, and of Mr. G. B. Cockburn, who devoted the better part of a year to instructing them at his own expense. Surely a pretty record for those whose duty it was to foresee intelligently the future needs of the Empire's first line of defence.

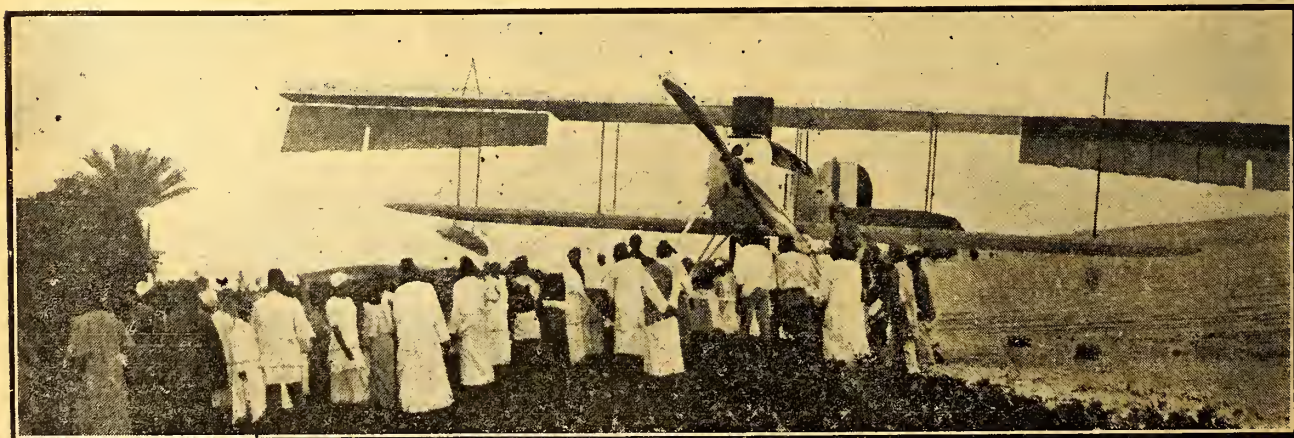
The R.N.A.S. has never been an integral part of the Navy, and it is little more so now than it was in the days when it began as a charitable institution.

THE R.N.A.S. AS IT MIGHT HAVE BEEN.

It is worth while, with our present knowledge of the war at sea, to consider what the R.N.A.S. might be doing now, if it were one with the Fleet, and if it had been handled at the beginning as it should have been.

One recalls that a solitary seaplane distinguished itself in the battle of Jutland, but it is admitted that the German Navy's Zeppelins did excellent service before the battle. Doubtless I shall be duly corrected if I am wrong, but it seems to me that, if we had had a number, say a dozen, really fast seaplane carriers which could have operated far ahead of the Fleet, we could have learned at least as much of the Huns' movements as they knew of ours, and could have prevented their airships from learning anything at all.

Granted that there was "low visibility," which means more or less of a fog, inherently stable seaplanes could



NATIVE LABOUR.—East African natives as a seaplane handling crew.

have wandered through it by compass, and above it they would have found the airships at their mercy.

If the comic edifices, and artifices, with which the R.F.C. destroys Zeppelins at night are good enough for their purpose, it should not have been difficult for the R.N.A.S. to have produced something better for use in slight fogs in daylight.

One admits the difficulty of dumping a seaplane overboard and getting it off in a heavy sea, but one did evidently get off, so why not more? And, in any case, why trouble to get a machine off the sea? Why not catapult it off the deck? It is certainly not less than four years since Lieuts. L'Estrange-Malone and Gregory, R.N., flew off the decks of ships while under way, and it is at least as long since Mr. Glenn Curtiss alighted on the deck of a ship at anchor. Also, it is nearly as long since the late M. Pégoud departed from and alighted on a wire without touching ground.

May one ask what our high-browed scientists at the Admiralty have done in two years of peace and two years of war to improve on these performances?

THE NEGLECT OF SEAPLANE-CARRIERS.

The whole question of seaplane-carriers has been grossly neglected—through no fault of active-service R.N.A.S. officers. While real progress might easily have been made in this direction, tens of thousands of pounds' worth of unreplaceable material and probably hundreds of thousands of man-hours have been wasted on trying to build huge freak seaplanes, which, however interesting they may be as experiments, and however efficient they may be in theory, are never likely to be of the remotest use in war, whatever they may be as Transatlantic freighters in time to come.

The same time, material, and shop space could have produced dozens, and probably hundreds, of useful aeroplanes in the same period, and, if a tenth of the money had been intelligently spent on launching experiments, we should have had something worth while long before the Jutland affair.

The seaplane carrier problem before the war produced that lamentable tin tub H.M.S. "Hermes," which ought to have been invalidated out of the Service five or six years ago. Also, it produced H.M.S. "Ark Royal," a sawed-off tramp, which on service looks like a cross between an oil-tank and a travelling menagerie. I gather that at full speed her movement is perceptible if there is a shore on which to take a sight, but that one reckons her speed in knots per month, and that she would not be a

certainly worth backing if the late lamented Captain Noah could be resuscitated and persuaded into racing the other Ark against her. Since then sundry packet-boats have been pressed into service, including a liner which is reputed to hold together by a combination of much paint and hoping for the best.

The real seaplane-carrier should have at least a speed of 40 knots when pressed. It is essential that she should be faster than any destroyer or cruiser that the enemy could send after her, for she would be unarmoured and practically unarmed, except perhaps for a big stern-chaser and some anti-aircraft "Archies." Her job would be to run, not to fight, and to run so fast that she could run round an enemy squadron and keep her rendezvous with her aeroplanes after leading the enemy away from it.

Moreover, at 40 knots, practically no auxiliary power would be needed to launch an aeroplane from her deck, because even in a flat calm the machine would be almost at its lowest flying speed before it started, and against anything of a breeze it would have flying speed to spare.

Similarly, in alighting, the aeroplane would be able to slow down till it hovered over the landing apparatus at the same speed, and would drop at the opportune moment. And thus the mere speed of the ship would wash out half the problems of launching and alighting.

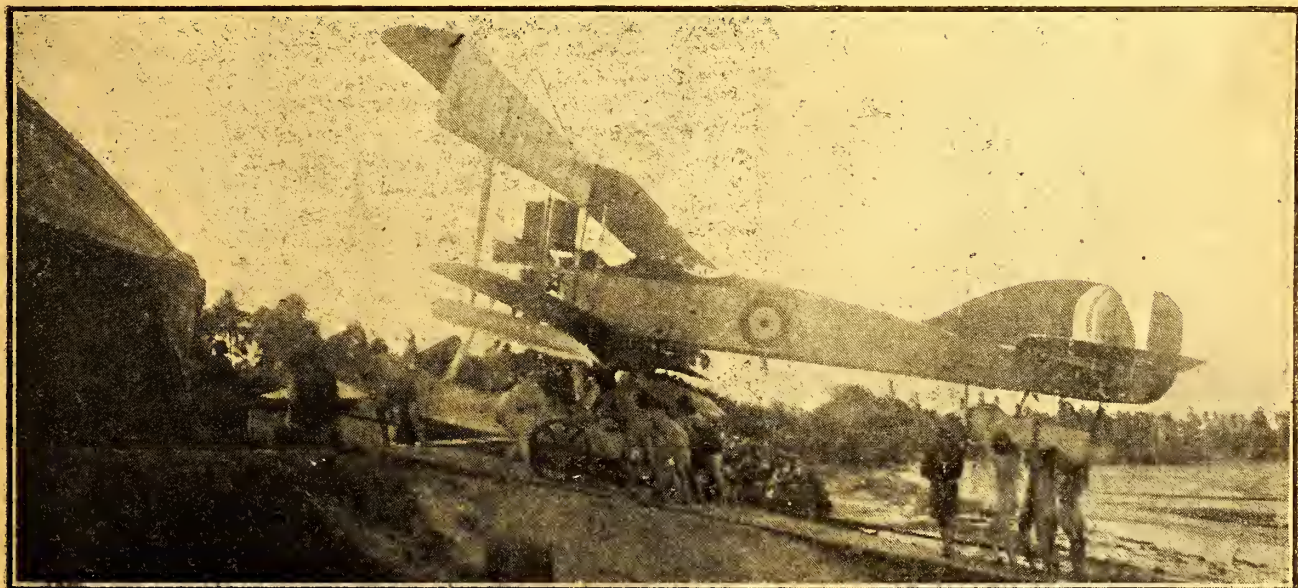
THE POSSIBILITIES OF SEAPLANE-CARRIERS.

Suppose for a moment that we had had a fleet of such ships at the outbreak of war—and only official stupidity prevented us from having them, for seaplane-carriers have been preached at intervals since the beginning of 1913. *Vide THE AEROPLANE* then and since, and certain publications of the Navy League.

In the first place, how long would it have taken to find the "Emden" if there had been five seaplane-carriers sweeping the Indian Ocean abreast and 100 miles apart, with their aeroplanes quartering the intervening sea like pointers, each machine starting simultaneously by wireless signal with one from its opposite number, and meeting at the 50-mile line?

Similarly, how long would it have taken to find and destroy the "Königsberg"? She was only reached after months of delay and futile footling with utterly unsuitable machines flying from an island twenty or thirty miles away.

Also, think what such seaplane-carriers could have done in finding the "Karlsruhe" and other commerce raiders, and in finding the late Admiral von Spee's



THE WHITE MAN'S BURDEN.—R.N.A.S. men, "au naturel," hauling a seaplane ashore in East Africa.

squadron. As it was, we had not even a seaplane station on the Aucklands to give warning when he approached.

THE SUPPRESSION OF SUBMARINES.

To come down to present times. Think what flotillas of such craft could do in suppressing submarine frightfulness. What could U.53 or U.57, or whatever they may be, do off the American coast if we had regular seaplane patrols along the trade routes. Half a dozen 40-knotters, with half a dozen aeroplanes apiece, always in commission, would make the sea roads safer than Piccadilly.

Just in the same way the Channel, the Norwegian route, and the Northern coasts of Ireland and Scotland could be properly patrolled. And there would be no "Persia" and "Arabia" affairs in the Mediterranean.

One distinguished Admiral, who does actually know most of what there is to know about aeroplanes, proposed a proper aeroplane patrol system in the Mediterranean very early in the war, but one assumes that, knowing as much as he did about the subject, his sound advice was not wanted. At any rate, he has not been employed on aircraft work, and apparently his scheme was not even considered.

And kindly recollect that all this is within the range of practical politics, for an aeroplane can operate easily in any wind in which the sea permits a submarine to make decent shooting.

Instead of results from seaplane-carriers, we find official eulogies of seaplanes which, astonishing to relate, manage to cross a range of hills of the ominous altitude of 4,000 feet or so, and bomb a railway on the other side, thus disturbing a number of perfectly peaceful Turks, whose chief ambition in life is to be let alone, so long as they let other people alone.

One will probably hear, at this rate, of a gallant action in which a seaplane has raided some mountain fastness and successfully put the enemy out of action by shooting up at them when it had reached the limit of its climb.

If Mr. Tennyson d'Eyncourt and his able staff had concentrated on such fast seaplane-carriers in the past, and had continued so to devote their attention, instead of being side-tracked onto comic "tanks" and other things, they would have done a power of good for the Navy.

THE AIRSHIP PROBLEM.

Also, if the energy which has been expended of late on airships had been turned onto aeroplane work, we should be better off in the near future. By all means go on with airship experiments, for we are almost bound to produce something worth having in time for the next war. But do not let us overdo it and waste man-hours and material on big airships as we have wasted them on big aeroplanes in the past. Let us produce a single good one first, and then reproduce it. There is no sense in building a lot of experimental things all alike.

One would give quite a good deal to hear the yarns which have been spun to the Air Board in order to obtain their approval of certain programmes put before them, and one would like still more to know that these distinguished people have had the opinions of the men who know most about airships from actual hard experience. The man who has wrestled with the controls of an inherently, automatically, perpetually, and utterly damnable unstable airship throughout a six-hour patrol could probably impart considerably more information than the man who has never wrestled with anything worse than a slide-rule or a refractory mooring line.

"BUILDING IN."

The Real Navy has an excellent custom, when a new craft is being produced, of sending an officer or so, who will afterwards have the handling of that craft, to be

"built in" along with it. The idea is that if he watches the ship being put together in detail he will know all about its personal peculiarities, and that, if anything goes wrong, he will be able to put it right without having to puzzle out how and why this or that works. Thereafter he trains the first crew of the ship to know as much as he does himself, and later on, if and when he hands over his job to someone else, he is able to put his successor up to the craft's tricks.

Just by way of showing how different is the way of the R.N.A.S. from that of the Navy, it is worth while to recall that until quite recently no R.N.A.S. officer was permitted even to visit an aircraft factory without special leave, nor was this rule relaxed in favour of officers who were personal friends of individual manufacturers. Ostensibly the idea was to prevent flying officers from becoming too friendly with the "Trade," and thus coming consciously or unconsciously under the influence of the manufacturer, and so developing into advocates of one particular type or make of aeroplane.

So far as one can get at the truth, it seems much more likely that it was a clever dodge worked by the technical side of the Admiralty to prevent flying officers (a) from learning too much about new types of machines which the manufacturers were producing, and so becoming dissatisfied with the machines they were then flying, (b) from learning too much about modern aeroplane design, and so finding out how little practical knowledge the so-called technical people possessed, and (c) from seeing how the production of much-wanted machines was being delayed by the vagaries of these technical people.

It does not need any vast intelligence to see that the more the flying officer knows the better, and it is at least certain that where a squadron is to be equipped with machines of certain type certain officers of known mechanical ability and a certain number of men of that squadron should be "built in" with the machines. In no other way can that squadron's pilots be sure that their machines are properly rigged and trimmed and tuned and repaired.

In just the same way engineer officers and mechanics should be "built in" with new types of engines. I have yet to hear of a squad of R.N.A.S. air-mechanics being stationed at an engine factory to learn the tricks of the brute from the maker's engine-tuners. Yet the R.F.C. does it regularly. I have never, in fact, even heard of air-mechanics being trained to specialise on any one make of engine, as they should be trained. The whole R.N.A.S. system is so lax and without system, barring the running of certain squadrons and air stations, that a very general overhaul is needed in this direction, whether the service remains R.N. or whether it goes forth into the wilderness as a Third Service.

One is happy to say that there are brilliant exceptions. Certain officers have the Heaven-sent gift of preserving discipline without getting themselves disliked. I am told, though I have never been there, that what Felixstowe was before the war for neatness, orderliness, discipline, hard work, and efficiency, Grain is to-day, yet the junior officers there seem happier even than those from other stations where work is the exception and the day is chiefly spent in lounging about smoking cigarettes and drinking cocktails.

At another station, Eastchurch to wit, I am told that the C.O. has a pleasing habit, when bad weather makes flying impossible, of ordering all his quirks (the generic title for young R.N.A.S. officers) to get into running shorts. They are then loaded into all the available cars and transported six or seven miles into the country. There they are decanted into the road, their overcoats are put into the cars, and they are told to get home as best they can. At first there was a deal of grouching, but the fitter the youngsters became the keener they grew, and now the cross-country run, often over marshes and

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dykes full of mud, in pouring rain and gales, is regarded as excellent sport, especially as it gives the younger lads a chance of taking it out of their seniors.

Which, when you come to think about it, is a far more manly sport than doing stunts over the local pier for the admiration of the local flapper, and gassing about it afterwards in the lounge of the local Ritz.

There is, in fact, any quantity of good material in the

junior grades of the R.N.A.S., but it wants licking into shape. Also, the people at the top, whose petty jealousies and intrigues interfere with supplies of material and the proper use of personnel in the war, need licking into shape still more. Let us hope that the Air Board may acquire the power to do it, if their Lordships of the Admiralty are incapable of making the Air Service a part of the Navy.

C. G. G.

ASKING A FAVOUR.

Judging purely by the way in which the demand for this paper insists on growing, I cannot help feeling that quite a large number of people in this country find it interesting, or amusing, or so irritating that they have to go on buying it week after week. I am therefore emboldened to ask a favour of my readers, which is simply this: If you have been either instructed or amused in the past, will you acknowledge the fact by sending a contribution to the Royal Naval Air Service Comforts Fund, to Mrs. Sueter, The Howe, Watlington, Oxon?

That is, of course, unless you happen to be an officer or man in either of the Services, for naturally one does not want to appeal to those who should be much more generously treated by the Nation than they are. If, however, you happen to be a munition worker, and, therefore, drawing higher wages than you had ever believed possible, don't you think that it is rather your duty to contribute, say, one day's pay at least to the comfort of those who are doing their best under all sorts of discomforts and disadvantages to ensure your safety till the end of the war?

The R.N.A.S. has come in for a great deal of abuse, but that is not the fault of the men who are labouring to make the best of a bad job. Whether a seaplane is good or not does not help to warm the landing crew who have to wade out in wintry seas to man-handle it safely ashore, nor does it help to make life very much more amusing for the crew of an effete seaplane-carrier hammering through a winter gale.

The fact that we ought to have super-Zeppelins does

not help much to pass the time for the handling-party of a "Blimp" station stuck out on some deserted promontory miles from other human society, while their little ships are confined to their sheds by bad weather.

The work of the men of the out-stations, even more than those of the bigger stations, is strenuous while it lasts, and yet there are long hours of idleness, when time hangs heavily, and to relieve the boredom of these periods Mrs. Sueter has sent various games, musical instruments, gramophones, and so forth, to stations at home and abroad, and always they have been very highly appreciated. It is desired that these gifts shall be much more widely distributed in future.

The men of the R.N.A.S. are serving their country as truly as any in the other Services, and those responsible for the Fund wish to acknowledge their work at Christmas time. The Fund is now registered as required by Act of Parliament, and Mrs. Sueter, who has hitherto worked the whole thing single-handed, is now assisted by a well-chosen Committee. It is hoped that the receipts of the Fund will grow in proportion to the growth of the R.N.A.S.

The shillings of young aircraft workers are as welcome as the big cheques of wealthy men. May I therefore, as a purely personal matter between my readers and myself, ask that everyone will send a contribution of some kind, as a Christmas gift to the men of the R.N.A.S., to Mrs. Sueter, The Howe, Watlington, Oxon?

C. G. G.

THE AERONAUTICAL PICTURE SHOW.

The show of aeronautical pictures which has been organised by Lady Drogheda has received many interesting additions during the past few days, among the most important being Mr. F. Gordon Crosbie's Academy picture of the sinking of a Zeppelin by Flt. Lt. Warneford, V.C., which has been lent by Illife and Sons, Ltd., the proprietors of "The Autocar," who bought the picture when the Academy closed.

The originals of sundry drawings which have appeared in THE AEROPLANE will also be on view, including the fine oil-painting by Mr. G. H. Davis of a seaplane rising from the water, a reproduction of which was published as a supplement to this paper's Naval Issue.

As a contribution to the Irish Hospitals Fund, for which Lady Drogheda has organised the show, Mr. John Lavery is offering for auction a blank canvas, on which he has agreed to paint the portrait of any person nominated by the purchaser.

These are interesting additions to the main exhibition consisting of the collections of historical aeronautical prints and pictures belonging to Lady Drogheda herself, to Sir John Shelley, to Mr. Mortimer Singer, and to Mr. Behrens.

The exhibition was to open on Monday next, Nov. 20th, at the Knoedler Galleries, which are close to the Piccadilly end of Bond Street, but owing to the number of additions received this week, Lady Drogheda has decided to postpone the opening for a few days, so as to revise the catalogue accordingly. The date of opening will be announced in the Press.

THREE WEEKS.

The following letter appeared in the "Times" of Nov. 13th:—
Sir,—It is now three weeks since the Air Board report was circulated to the Cabinet, and nothing has yet been done. Important as is the question of man-power, it is not either politic

or prudent that the controversies thereby aroused should at successive Cabinet meetings squeeze out the equally momentous settlement of future air policy. I submit that our superiority in men in the spring offensive, unless we have simultaneously the unchallenged command of the air, cannot possibly bear the full fruit of decisive victory. Three precious weeks have been lost, and the masses are asking if the attitude of polite indifference initiated by the Admiralty representatives of the Air Board towards Lord Curzon has infected his colleagues in the Cabinet.

The Parliamentary Air Committee—drawn alike from the ranks of Tory, Radical, Labour, and Nationalist—are insistent and determined. They are fully seized of the pressing dangers of the situation, and the meaning of their tabled Resolution is abundantly clear. One and all are out for the self-same object—to see the Air Board so reconstituted that, under a high Cabinet Minister, there shall sit representatives of the Navy, Army, and Ministry of Munitions, possessed of co-equal powers and conscious of their strength for pressure in their respective Departments by reason of the authority possessed by their Chairman. Business men would settle this in half an hour; practical men, whether engaged in business or not, would not waste half a year in the solution of so simple a problem. A Board such as that outlined would command the confidence of the public, ruthlessly suppress deleterious Service jealousies, brush aside all inter-departmental friction, break down every barrier of obsolete conservatism, disperse the fog of conflicting policies, and finally form a basis for an effective independent Air Ministry, which, as night follows day, must, at the close of the war, be the final outcome of this question. *Insuperata accidunt magis saepe quam quae speres!*

I have the honour to be your obedient servant,

"SCRUTATOR."

[Evidently "three weeks" of Parliament does not produce such rapidity of movement as a novelist has imagined.—Ed.]

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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Nov. 7th, 1916.

ADMIRALTY, Nov. 4th.

The following prob. Flt. Sub-Lts. for temp. service have been confirmed in the rank of temp. Flt. Sub-Lt.:—H. E. Parker, H. W. Campion, Sept. 20th, 1915. D. Knowles, Sept. 22nd, 1915. H. Rampling, Nov. 17th, 1915. T. B. Williams, Jan. 3rd. K. G. Boyd, Feb. 3rd. N. D. M. Hewitt, Feb. 18th. L. A. Powell, Feb. 22nd. H. C. Randall-Stevens, Feb. 28th. J. F. Chisholm, Feb. 29th. G. B. Anderson, Mar. 29th. S. L. Bennett, April 3rd. W. E. Flett, April 13th. L. M. Bailey, April 19th. C. Gilmour, H. V. Rowley, April 30th. H. J. Bath, May 1st. C. B. Wincott, May 14th. W. H. Richardson, May 15th. R. J. Paul, May 21st. A. W. Carter, May 23rd. J. D. Haig, May 28th. J. D. Mackenzie, R. B. Frame, June 4th. R. K. J. Vallings, June 8th. R. P. Minifie, G. M. Part, June 11th. E. B. Gammon, V. C. Holyman, A. S. Mather, E. S. Arnold, June 18th. F. V. Branford, July 2nd. A. G. B. Ellis, E. R. Barker, July 5th. B. J. W. Brady, July 12th.

WAR OFFICE, Nov. 7th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Special Appts.—Graded as Park Comdrs.—Lt. (temp. Capt.) B. S. Foster, Hamps. R., T.F., and to be temp. Maj. whilst so empld., Sept. 2nd. Lt. (temp. Capt.) H. S. Ebben, Spec. Res., from an Equipment Officer, and to be temp. Maj. whilst so empld., Sept. 26th. Temp. Capt. F. W. K. Davies, A.S.C., to be transfd. to Gen. List, and to be temp. Maj. whilst so empld., Sept. 20th (substituted for notification in "Gazette" of Oct. 5th).

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so empld.:—Sec. Lt. (temp. Lt.) N. J. Bengough, Fife and Forfar Yeo., T.F.; Sec. Lt. (temp. Lt.) H. Hemming, Worc. R., Sept. 19th. Sec. Lt. W. G. Pender, Spec. Res., Oct. 16th. Temp. Sec. Lt. J. McArthur (Gen. List), Sec. Lt. G. S. Thorne (Spec. Res.), Oct. 18th. Sec. Lt. L. W. Hall, Bord. R., Oct. 20th.

Flying Officers.—Temp. Capt. J. W. Tailford, Gen. List, Aug. 4th (substituted for notification in "Gazette" of Aug. 25th. Sec. Lt. R. L. Edward, L'pool R., and to be secd., Oct. 17th. Temp. Sec. Lt. W. N. Hamilton, North'd Fus., and to be transfd. to Gen. List; Sec. Lt. F. W. Ward, N. Staff. R., and to be secd., Oct. 19th. Temp. Sec. Lt. J. R. Middleton, Cam'n Highrs., and to be transfd. to Gen. List, Oct. 20th.

Flying Officers (Observers).—Capt. H. H. Bagnall, Midd'x R., T.F., April 22nd. Lt. R. P. I. Cochrane, 17th Cav., Ind. Army; temp. Lt. W. A. Forsyth, R.A., and to be transfd. to Gen. List; Sec. Lt. E. N. D. Barr, R.F.A., Spec. Res.; Sec. Lt. L. H. Browning, R.A., and to be secd., Aug. 15th.

Equipment Officers, 3rd Cl.—Temp. Capt. T. E. Gilmore, North'n Fus., and to be transfd. to Gen. List, Aug. 17th. Temp. Sec. Lt. A. D. Bateman, R. W. Kent R., and to be transfd. to Gen. List, Aug. 22nd. Sec. Lt. G. A. Turner, Dorset R., Spec. Res., and to be secd.; temp. Sec. Lt. (on prob.) J. Jardine, R.E., Sept. 19th. Sec. Lt. (on prob.) R. Clelland, Spec. Res., Oct. 21st.

Asst. Experimental Officer.—(Graded as an Equipment Officer, 3rd Cl.)—Sec. Lt. (temp. Lt.) J. R. H. Whiston, Notts. and Derby. R., T.F., Oct. 18th.

MEMORANDUM.—Sgt.-Maj. A. M. Saywood, from R.F.C., to be Sec. Lt. for duty with R.F.C., Nov. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) G. S. Deane is confirmed in his rank.

C. R. Becke to be Sec. Lt., Sept. 3rd.

To be Sec. Lts. (on prob.):—H. L. U. Clark, Oct. 16th. J. R. McDonnell, Oct. 22nd. S. G. Elliott-Smith, Oct. 24th. T. H. Cooper, F. G. Buck, S. A. Mitchell, S. G. Linssen, C. Groves, S. Wilson, H. W. Prockter, L. H. Clifford, W. G. Murray, R. Rochford, F. D. Lugard, L. S. Pape, S. J. Vine, Nov. 5th.

TERRITORIAL FORCE.—R.F.C.—HAMPS. AIRCRAFT PARK.—Sec. Lt. (temp. Capt.) W. S. Farren is secd. for duty with the R.F.C., Oct. 22nd.

YEOMANRY.—NOTTINGHAMSHIRE (SHERWOOD RANGERS).—Sec. Lt. (temp. Lt.) E. R. Farmer is secd. for duty with the R.F.C., July 20th.

SUSSEX.—Sec. Lt. W. B. Clark is secd. for duty with the R.F.C., Oct. 22nd.

R.F.A.—E. LANCs. BRIG.—Sec. Lt. G. L. Owen is secd. for duty with the R.F.C., Sept. 26th.

LONDON BRIG.—Sec. Lt. (temp. Capt.) R. G. H. Pixley is secd. for duty with the R.F.C., Oct. 15th.

R.G.A.—LANCS. 2nd CHES.—Lt. (temp. Capt.) T. O. Ockleston is secd. for duty with the Anti-Aircraft Co., Aug. 26th, 1916.

SUSSEX.—Sec. Lt. (temp. Capt.) A. Q. Browning is secd. for duty with the Anti-Aircraft Co., Oct. 25th, 1916.

INFANTRY.—R. SCOTS.—Sec. Lt. (temp. Lt.) J. P. D. MacLagan is secd. for duty with the R.F.C., Oct. 14th.

CHESHIRE R.—Lt. (temp. Capt.) S. P. Gamon is secd. for duty with the R.F.C., Oct. 8th. Sec. Lt. A. P. Hartley is secd. for duty with the R.F.C., Oct. 21st.

LOND. R.—Lt. (temp. Capt.) J. L. Head is secd. for duty with the R.F.C., Oct. 5th.

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From the "London Gazette" Supplement, Nov. 8th, 1916.

WAR OFFICE, Nov. 8th.

REGULAR FORCES.—Wt. Officers, N.C.Os., and men to be temp. Sec. Lts. (on prob.) for services in the field:—

MEMORANDA.—For duty with R.F.C.—Sergt. Samuel Jolley, from R.F.C., Oct. 10th, 1916. Sergt. John Richard Bingham, from H.A.C., T.F., Oct. 12th, 1916. Oct. 13th, 1916: Acting Sergt.-Maj. Fred Knight, from R.F.C.; Acting Sergt. John William Askham, from R.F.C.; 2nd Cl. Air Mech. Reginald George Shackel, from R.F.C. Oct. 14th, 1916: Corpl. George Gordon Williams, from 28th Lond. R., T.F.; 1st Cl. Air Mech. Patrick Scott Riach, from R.F.C.; Pte. K. R. Napier, from Can. Corps Cav. Regt. Oct. 15th, 1916: 1st Cl. Air Mech. Charles Albany Stevenson, from R.F.C.; Pte. Bernard Williams Arthur Ordish, from Lond. R., T.F.; Acting Sergt. H. S. Elliott, from Can. A.S.C., Oct. 16th, 1916.

ESTABLISHMENTS.—R.F.C.—Wing Comdrs.—From Sqdn. Comdrs., and to be temp. Lt.-Cols. whilst so empld.:—Capt. (temp. Maj.) R. P. Mills, M.C., R. Fus.; Capt. (temp. Maj.) T. W. C. Carthew, D.S.O., Bedf. R., S.R., Sept. 21st.

Flt. Comdrs.—From Flying Officers:—Temp. Capt. F. D. Berridge, Gen. List; Sec. Lt. A. S. C. MacLaren, K.C., K. O. Seco. Bord., S.R., and to be temp. Capt. whilst so empld., Oct. 9th.

Flying Officers.—Sec. Lt. (temp. Lt.) D. V. D. Marshall, High Divl. Trainas, A.S.C., T.F.; temp. Lt. J. K. Robertson, A.S.C., and to be transfd. to Gen. List; Sec. Lt. (on prob.) A. E. Venables, S.R., Oct. 4th. Temp. Sec. Lt. F. S. Potts, Gen. List, Oct. 19th. Temp. Sec. Lt. (on prob.) A. R. Nock, R. War. R., and to be transfd. to Gen. List; Sec. Lt. (temp. Lt.) W. F. T. James, Glamorgan Yeo., T.F.; temp. Sec. Lt. (temp. Lt.) W. G. Chambers, Linc. R.; temp. Sec. Lt. W. Mitton, Linc. R.; temp. Sec. Lt. E. A. Welch, R. Lanc. R., and to be transfd. to Gen. List; Capt. W. W. Leete, Ches. R., T.F.; temp. Lt. N. A. Birks, Machine Gun Corps (Motor), and to be transfd. to Gen. List; temp. Sec. Lt. J. F. Duff, Gen. List, Oct. 20th. Sec. Lts. (on prob.) N. L. Knight, and R. W. Jones, Spec. Res., Oct. 21st. Sec. Lt. (temp. Capt.) W. S. Farren, Aircraft Parks, R.F.C., T.F.; Sec. Lt. R. M. Findlay, Co. of Lond. Yeo., T.F.; temp. Sec. Lt. (on prob.) E. T. Collins, Gen. List; Sec. Lt. (on prob.) D. N. Robertson, Spec. Res., Oct. 22nd. Temp. Sec. Lt. E. Hamilton, Machine Gun Corps, and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) R. N. Smith, Hamps. R., and to be transfd. to Gen. List; Sec. Lt. (on prob.) F. C. Young, Spec. Res., Oct. 23rd. Sec. Lt. (on prob.) A. L. Macfarlane, Spec. Res., Oct. 24th.

Equipment Officer, 3rd Cl.—Sec. Lt. C. R. Becke, Spec. Res., Oct. 2nd.

MEMORANDUM.—Pte. Ernest Edwards, from A.S.C., to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Oct. 27th, 1916.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) D. N. Keith is confirmed in his rank. To be Sec. Lts. (on prob.):—G. Urquhart, Oct. 21st. J. H. Secker, A. G. Stradling, O. L. Vetter, J. D. Richards, Nov. 5th.

TERRITORIAL FORCE.—YEOMANRY.—GLAMORGAN.—Sec. Lt. (temp. Lt.) W. F. T. James is secd. for duty with R.F.C., Oct. 20th.

3RD CO. OF LOND.—Sec. Lt. R. M. Findlay is secd. for duty with R.F.C., Oct. 22nd.

* * *

From the "London Gazette" Supplement, Nov. 9th, 1916.

WAR OFFICE, Nov. 9th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers (Observers).—Temp. Lt. D. M. Murdoch, Essex R., and to be transfd. to Gen. List; temp. Sec. Lt. L. B. Williams, Army Cyclists Corps, and to be transfd. to Gen. List; Sec. Lt. G. F. Bishop, Lond. R., T.F.; temp. Sec. Lt. L. Waight, Gen. List, Oct. 24th. Temp. Sec. Lt. E. T. Pruen, Gen. List, Oct. 25th.

MEMORANDUM.—Pte. F. M. Thomas, from Bedf. R., T.F., to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Nov. 5th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—F. C. Young, G. R. Nicholson, R. Donald, A. L. Macfarlane, A. S. F. Morris, A. E. Venables, D. N. Robertson, R. W. Jones; H. G. Gold to be Sec. Lt., Sept. 3rd. E. Butler to be Sec. Lt. (on prob.), Aug. 24th.

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From the "London Gazette," Nov. 10th, 1916.

WHITEHALL, Nov. 7th.

The King has been pleased to give and grant unto Vice-Admiral Sir REGINALD HUGH SPENCER BACON, K.C.B., K.C.V.O., D.S.O., His Majesty's Royal licence and authority to wear the Insignia of Grand Officer of the Order of Leopold, which Decoration has been conferred upon him by His Majesty the King of the Belgians in recognition of valuable services rendered by him.

WAR OFFICE, Nov. 10th.

REGULAR FORCES. — ESTABLISHMENTS. — R.F.C. — Flt. Comdrs.—From Flying Officers, and to be temp. Cpts. whilst so empld.:—Sec. Lt. G. P. S. Reid, M.C., Sea. Highrs.; Sec. Lt. E. Henty, Spec. Res., Oct. 30th.

Balloon Officers.—Temp. Capt. H. V. Knox, Oxf. and Bucks L.I., and to be transfd. to Gen. List, Lt. H. N. Witting, R. W. Surr. R., Spec. Res., and to be sec'd., temp. Sec. Lts., Gen. List, E. H. Channon, H. W. Ingram, R. G. C. Pinfield, W. E. Wright, Oct. 14th.

Equipment Officers, 3rd Cl.—Sec. Lt. (on prob.) A. E. Verpilleux, Spec. Res., July 31st; Sec. Lt. I. M. Rodney, Dorset R., from a Flying Officer, Aug. 17th. Sec. Lt. (on prob.) W. Birtwistle, Spec. Res., Sept. 4th. Sec. Lt. F. I. Fletcher, Manch. R., T.F., Sept. 13th. Temp. Sec. Lt. A. L. Pearce, Gen. List, Sec. Lt. H. G. Gold, Spec. Res., Oct. 1st. Temp. Sec. Lt. V. C. Legg, Gen. List, Oct. 2nd. Temp. Sec. Lt. (on prob.) H. A. Blanchard, Gen. List; Temp. Sec. Lt. (on prob.) L. A. Goss, Gen. List, Oct. 4th. Sec. Lt. (on prob.) R. N. Vyvyan, Spec.

Res., Oct. 9th. Sec. Lt. R. H. Rayner, W. Rid. R., T.F., Oct. 12th. Temp. Sec. Lt. C. R. Coffey, Gen. List, Oct. 16th. Sec. Lt. (on prob.) H. E. Earl, Rif. Brig., Spec. Res., and to be sec'd., Oct. 19th.

MEMORANDA.—2nd Cl. Air Mech. L. P. Timmins, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with the Mil Wing of that Corps, Nov. 5th.

C. Channing to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Nov. 6th.

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From the "London Gazette" Supplement, Nov. 11th, 1916.

WAR OFFICE, Nov. 11th.

REGULAR FORCES. — ESTABLISHMENTS. — R.F.C. — Flying Officers.—Sec. Lt. W. B. Clark, Sussex Yeo., T.F., Sec. Lt. P. L. Wood, Spec. Res., Oct. 22nd. Maj. O. M. Conran, R. Lanc. R.; Lt. C. H. Windrum, R. W. Kent R., and to be sec'd., Oct. 23rd. Sec. Lt. (temp. Lt.) R. W. P. Hall, W. Lan. Brig., R.F.A., T.F.; Sec. Lt. W. W. Cowan, R. Scots, T.F.; Sec. Lt. G. E. Gordon Duff, Cam'n. Highrs., and to be sec'd., Oct. 24th. Temp. Lt. E. H. Tatton, E. York. R., and to be transfd. to Gen. List, Oct. 25th.

Balloon Officers.—Sec. Lt. (temp. Lt.) B. D. Higman, Lond. R., T.F.; Sec. Lt. A. R. Wilkie, Midd'x. R., T.F.; temp. Sec. Lt. H. Cresswell, Gen. List; temp. Sec. Lt. S. C. Lumb, Gen. List; temp. Sec. Lt. C. E. Mott, Gen. List, Oct. 26th.

WIRELESS AND OBSERVERS' SCHOOL.—Comdt. (Graded as a Park Comdr.).—Lt. (temp. Capt.) H. A. Oxenham, Spec. Res., from an Equipment Officer, and to be temp. Maj. whilst so empld., Oct. 8th.

MEMORANDUM.—Cdt. A. Gane to be temp. Sec. Lt. (on prob.) for duty with R.F.C.

SPECIAL RESERVE OF OFFICERS. — SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. H. D'O. Benningfield is dismissed the Service by sentence of a General Court-Martial, Sept. 7th.

The appointment of Sec. Lt. (on prob.) A. C. Blackmore, notified in the "Gazette" of July 27th, is antedated to June 19th.

Sec. Lts. (on prob.) are confirmed in their rank:—W. Birtwistle, P. L. Wood, A. E. Verpilleux, R. N. Vyvyan. H. L. Webb to be Sec. Lt., Oct. 19th. L. A. Owen to be Sec. Lt. (on prob.), Nov. 5th.

TERRITORIAL FORCE. — INFANTRY. — BEDFORD R. — Lt. (temp. Capt.) E. A. M. Waterton relinquishes his commn. on appointment to the R.N.A.S., Nov. 12th.

* * *

The King has been pleased to award the Meritorious Service Medal to the undermentioned warrant officers, non-commissioned officers, and men, in recognition of valuable services rendered with the armies in the field during the present war:—

- 4310. Cpl. G. D. Bell, R.F.C.
- 348 Flt. Sergt. H. E. Bethell, R.F.C.
- 605 Sergt.-Maj. G. Felstead, R.F.C.
- 1112 Actg. Sergt.-Maj. J. Fulton, R.F.C.
- 178 Flt. Sergt. (Actg. Sergt.-Maj.) J. R. Gardiner, R.F.C.
- 498 Flt. Sergt. S. R. Goldthorpe, R.F.C.
- 1711 Cpl. G. Green, R.F.C.
- 136 Flt. Sergt. H. Green, R.F.C.
- 1025 Flt. Sergt. A. Hawley, R.F.C.
- 718 Flt. Sergt. F. J. Hellyer, R.F.C.
- 780 Sergt. G. W. Heppel, R.F.C.
- 2057 Sergt. H. E. Hunt, R.F.C.
- 607 Cpl. T. Hyland, R.F.C.
- 4999 Actg. Sergt.-Maj. A. Knight, R.F.C.
- 3599 Actg. Sergt.-Maj. W. G. Mantell, R.F.C.
- 2988 Actg. Sergt.-Maj. E. Meynell, Hdqrs., R.F.C.
- 8347 Actg. Sergt.-Maj. Millington, R.F.C.
- 217 Flt. Sergt. D. H. Newton, R.F.C.
- 1027 Actg. Sergt.-Maj. C. Rapley, R.F.C.
- 5853 1st Cl. Air Mech. S. Shearing, R.F.C.
- 4865 Cpl. V. E. Wansbury, R.F.C.
- 2862 Cpl. R. S. Weaver, R.F.C.
- 198 Sergt.-Maj. E. Wilton, R.F.C.
- 1071 Flt. Sergt. E. R. Wood, R.F.C.

* * *

From the "London Gazette" Supplement, Nov. 13th, 1916.

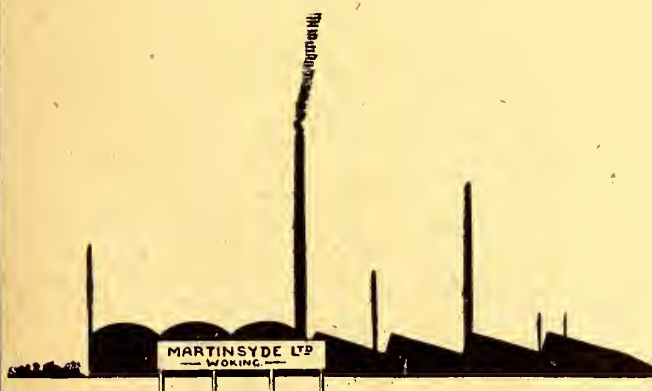
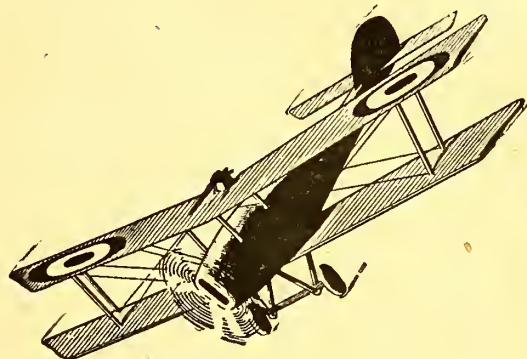
WAR OFFICE, Nov. 13th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MILITARY WING.—Flying Officers.—Sec. Lt. A. N. G. Summers, 9th Lrs., and to be sec'd., Oct. 1st. Sec. Lt. E. N. Griffith, Oxf. and Bucks. L.I., Spec. Res., and to be sec'd., Oct. 21st. Sec. Lt. F. W. Partington, S. Lan. R., Spec. Res., and to be sec'd., Oct. 23rd. Sec. Lt. C. T. Wilson, R. Ir. Fus., Spec. Res., and to be sec'd.; temp. Sec. Lt. (on prob.) E. W. A. Hunt, Gen. List; Sec. Lt. E. A. Mearns, Spec. Res.; temp. Sec. Lt. T. H. Gladstone, Gen. List; temp. Sec. Lt. F. E. Wilshire, Rif. Brig., and to be transfd. to Gen. List; temp. Sec. Lt. J. H. Medcalf, Bord. R., and to be transfd. to Gen. List; Sec. Lt. D. McC. Kerr, Spec. Res., Oct.



One of the last but most pleasurable duties of the Lord Mayor, Colonel Sir Charles Cheers Wakefield, before going out of office, was to hand over to General Headquarters, Home Forces, at the Horse Guards, 353 gold medals for distribution to that number of officers and men who were instrumental in bringing down L15 on the night of March 31st-April 1st, 1916, on the Thames Estuary. The medal is shown above.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

24th. Temp. Capt. J. E. Chick, A.S.C., and to be transfd. to Gen. List, Oct. 25th.

Balloon Officers.—Sec. Lt. (temp. Lt.) K. M. Cattley, R. Suss. R., T.F.; Lt. A. Knight, N. Lan. R., from Machine-gun Corps, and to remain secd.; Sec. Lt. (on prob.) C. Booth, E. Surr. R., and to be transfd. to Gen. List; temp. Sec. Lt. G. K. Cathies, Gen. List; Sec. Lt. C. Deards, Spec. Res.; Sec. Lt. H. Y. C. Clarke, S. Wales Bord., and to be secd.; Sec. Lt. (temp. Lt.) C. M. Down, Herts. R., T.F.; Sec. Lt. J. B. Mendam, R.W. Fus., T.F.; temp. Sec. Lt. J. S. Giffard, Manch. R., and to be transfd. to Gen. List; temp. Sec. Lt. H. F. Fuller, D. of Corn. L.I., and to be transfd. to Gen. List; temp. Sec. Lt. H. F. Darby, E. Surr. R., and to be transfd. to Gen. List; temp. Sec. Lt. W. A. J. Gribble, Gen. List, Oct. 26th.

Equipment Officers, 3rd Cl.—Sec. Lt. P. H. R. Whittet, Spec. Res., Sept. 29th. Temp. Sec. Lt. C. H. Simpson, Gen. List, Oct. 2nd. Sec. Lt. H. L. Webb, Spec. Res., Oct. 27th.

SCHOOL OF AERIAL GUNNERY.—Asst. Instrs.—(Graded as Equipment Officers, 2nd Cl.), and to be temp. Lts. whilst so empd.:—Temp. Sec. Lt. H. Cockerell, Gen. List, from a Flying Officer (Observer); Sec. Lt. P. H. R. Whittet, Spec. Res., from an Equipment Officer, 3rd Cl., Oct. 24th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) confirmed in their rank:—R. Clelland, E. E. Cutts, D. McC. Kerr, C. Deards, E. A. Mearns, P. H. R. Whittet.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Nov. 8th.—Messrs. A. C. Burt and G. R. Marshall, both entered as Proby. Flt. Sub-Lt. (temp.), seny. respectively Sept. 26th and Oct. 2nd, and apptd. to "President," addl., for R.N.A.S.

Mr. H. B. Maund, entered as Proby. Flt. Officer (temp.), seny. Nov. 6th, and apptd. to "President," addl., for R.N.A.S.

Mr. L. J. Nobbs, entered as Warrant Officer, 2nd Grade (temp.), seny. Nov. 6th, and apptd. to "President," addl., for R.N.A.S.

Temp. comms. as Sub-Lt. (R.N.V.R.) have been granted, seny. as follows, and all apptd. to "President," addl., for R.N.A.S.:—F. H. Stringer and B. E. Harrison, Nov. 4th; and A. E. Sole, Nov. 6th.

Sub-Lts. (R.N.V.R., temp.).—H. Eves and E. E. W. Butt, both promoted to rank of Lt. (temp. R.N.V.R.), seny. Nov. 4th.

Nov. 9th.—Wt. Engr.—N. E. Calder, to "Blake," Nov. 7th.

Sub-Lts. (temp., R.N.V.R.).—G. Hazleton and A. P. Reed, both promoted to Lts. (temp., R.N.V.R.), seny. Nov. 5th.

The following have been entered as Proby. Flt. Officers (temp.), seny. Nov. 12th, and apptd. to "President," addl., for R.N.A.S.

T. W. G. Thomson, J. M. McCleerey, D. E. Penney, J. L. Langton, and A. C. Gilmer.

Nov. 10th.—Messrs. C. H. Swann and S. J. Green, both granted a temp. commission as Sub-Lt. (R.N.V.R.), seny. Nov. 8th.

Nov. 13th.—The following have been entered as Proby. Flt. Officers (temp.), seny. as stated:—S. H. H. Ash, Nov. 10th. L. H. G. Gillespie and H. R. Dyke, Nov. 19th.

Temp. commissions as Sub-Lt. (R.N.V.R.) have been granted to the following, seny. as follows:—W. E. Rootes, E. A. Plantrose, and I. H. McClure, Nov. 10th; and J. W. Morley, Nov. 26th.

Nov. 14th.—The undermentioned have been entered as Proby. Flt. Officers (temp.), seny. as follows:—D. H. F. McMaster, Sept. 3rd. P. C. L. Young, C. H. Attlee, R. G. Jenkin, T. F. Gillespie, S. Quayle, H. L. Nelson, W. B. W. Clarke, and E. E. Butler, Nov. 19th.

* * *

OFFICIAL COMMUNIQUÉS.

Nov. 10th.—An attack was carried out in the early hours of this morning on the harbour and submarine shelters at Ostend and Zeebrugge by a squadron of naval aeroplanes.

A great weight of bombs was dropped with satisfactory results.

Nov. 11th.—With reference to the attack on Ostend and Zeebrugge carried out by a squadron of naval aeroplanes on 10th inst., one of our machines (Flt. Lt. Geoffrey G. G. Hodge, R.N.) has failed to return. A Berlin official report states that he has been taken prisoner. All the other machines returned safely.

Nov. 12th.—On Nov. 10th a squadron of naval aeroplanes, operating against the Bulgarian coast, successfully bombarded enemy aerodromes and stores at Drama, Porna, and Angistra.

Excellent results were achieved.

The bombardment of the enemy's steel works at Völklingen by British aeroplanes referred to in the French communiqué of Nov. 11th was carried out by a squadron of the Royal Naval Air Service.

Nov. 13th.—At noon yesterday, the 12th inst., a squadron of naval aeroplanes carried out an attack on the harbour at Ostend.

A considerable number of bombs were dropped on the Ateliers de la Marine and on the war vessels in the harbour.

THE CASUALTY LIST.

Reported Nov. 14th.

ACCIDENTALLY KILLED.—Malet, Flt. Sub-Lt. F. A. R., R.N. DIED OF INJURIES.—Stewart, Flt. Sub-Lt. W. S., R.N. ACCIDENTALLY INJURED.—Curtis, Prob. Flt. Sub-Lt. W. A., R.N. OFFICIALLY REPORTED PRISONER.—Hodge, Flt. Lt. G. G. G., R.N.

PERSONAL NOTICES.

DEATH.

STEWART.—On Nov. 8th, the result of an accident while flying on duty, Flt. Sub-Lt. William Stewart Stewart, R.N.A.S., elder son of the late J. F. Tarratt and Mrs. Henry Rogers, of Ellary, Argyllshire, aged 19.

Flt. Comdr. HANS ACWORTH BUSK, R.N., missing since Jan. 6th, 1916. Any definite information that might be obtained from relatives of prisoners of war in Turkey concerning the fate of this officer would be gratefully received by his mother, Mrs. Busk, 6, Wadham Gardens, Regent's Park, N.W.

* * *

By an Order in Council published in the "London Gazette" of Nov. 7th it is provided that tuition fees up to a limit of £75 shall be refunded to commissioned and warrant officers who qualify for the Royal Aero Club's certificate at their own expense before entering the Royal Naval Air Service.

It is stipulated that payment shall not be made until confirmation in rank, or two months' service in the case of officers confirmed on entry, and that officers who resign or are discharged for causes within their own control within three years of entry may be required to repay the whole or a part of the sum received.

One may ask what school is going to take an Admiralty pupil at £75 when the War Office pays £125 a head. This petty parsimony is so like an Admiralty which wastes thousands a day on "dud" American motor boats.

MILITARY.

G.H.Q. COMMUNIQUÉS.

Nov. 10th, 9.49 p.m.—As the result of the improvement in the weather there was great aerial activity yesterday and much useful work done. Many bombing raids were carried out on the enemy's communications, billets, and stores.

Air fighting was almost continuous.

One of our squadrons of 30 machines encountered a squadron of from 30 to 40 machines and an aerial battle took place.

The enemy's squadron was broken up and dispersed. Six of his machines were seen to commence to fall out of control; but owing to the severity of the fighting it was not possible to watch them to the ground.

As a result of other fights nine more hostile machines were driven down in a damaged condition. Three of these are known to have been destroyed. A hostile kite balloon was also attacked and sent down in flames.

Seven of our machines are missing.

Nov. 11th, 9.57 p.m.—Yesterday there was again considerable activity in the air. During the day bombing raids were continued with effect against enemy hutments, aerodromes, and headquarters, and at night the enemy's stations and trains were successfully attacked. Two trains were hit with bombs, while a third was set on fire and a number of explosions followed.

In the course of numerous air fights three enemy machines were destroyed, and a fourth was forced to land in our lines. Many others were driven down in a damaged condition. One of our machines is missing.

* * *

WAR OFFICE COMMUNIQUÉS.

Nov. 12th.—The General Officer Commanding British Forces in Greece reports:—On the Struma front our patrols encountered hostile detachments and took some prisoners.

Enemy aerodromes at Drama and camps near Porna were successfully bombed by our naval aircraft.

Nov. 13th.—The General Officer Commanding-in-Chief in Egypt reports two successful air attacks on Maghdaba (100 miles east of Ismailia) and Birsaba. At Maghdaba the enemy's camp and store sheds were bombed, and a number of direct hits caused much damage.

At Birsaba a 100 lb. bomb hit the aerodrome; an Aviatik whilst being brought from the hangar was directly hit, the hangar also being damaged. Bombs were dropped on the railway station, sidings, and rolling stock, which suffered much damage.

Two hostile Fokkers were driven down in a damaged condition. Bombs equivalent to a ton of high explosive were dropped during the two raids.

All our machines have returned safely in spite of very heavy fire from anti-aircraft guns and attacks of enemy aircraft.

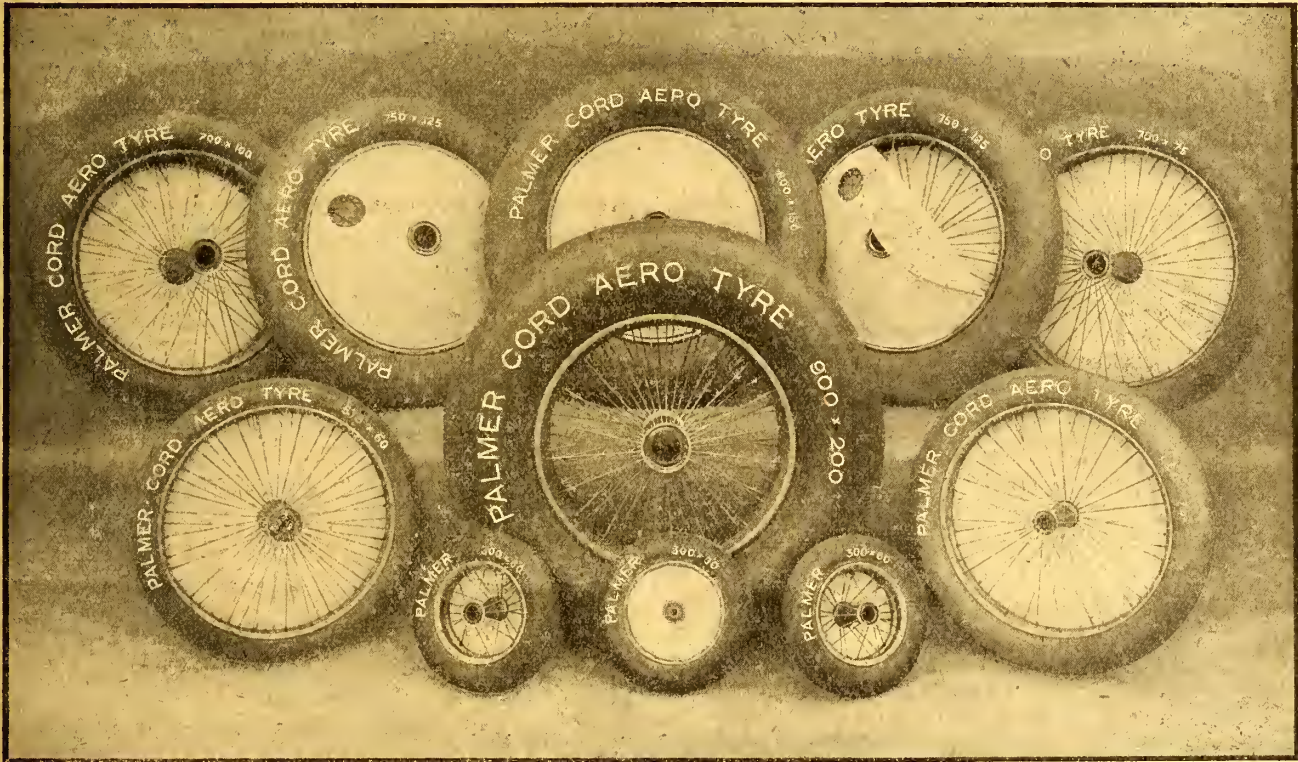
[Birsaba is the Biblical Beersheba.—Ed.]

Nov. 13th.—The General Officer Commanding British forces

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		Length	Bore				Length	Bore				Length	Bore	
300×60	16	m m	m m	Central	700×75	9	m m	m m	132/46	750×125	2	m m	m m	135/50
"	17	111.12	25.4	Central	"	20	178.	44.45	132/46	"	4	185.	55.	entral
		72.39	12.7		"	75	178.	31.75	132/46	"	18	178.	44.45	132/46
450×60	30	89.	31.75	Central						"	26	150.	40.	Central
575×60	14	150.	38.1	104/46	700×100	2	185.	55.	135/50	"	33	150.	38.1	Central
"	21	160.	28.	Central	"	4	185.	55.	Central	800×150	8	185.	55.	135/50
"	34	150.	31.75	104/46	"	18	178.	44.45	132/46	"	10	185.	55.	Central
600×75	14	150.	38.1	104/46	"	26	150.	40.	Central					
"	21	160.	28.	Central	"	33	150.	38.1	Central	900×200	42	185.	60.32	125/60
"	34	150.	31.75	104/46	"	38	185.	38.09	132/46	"	47	185.	55.	125/60
					"	66	178.	38.89	132/46					

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

in Mesopotamia reports: Since the communiqué of the 3rd inst. the military situation remains unchanged.

On Nov. 7th two British aeroplanes bombarded, with good results, the headquarters of some Turkish irregulars near Al Ain, on the Euphrates, 45 miles west of Nasiriyeh.

Nov. 13th.—The General Officer Commanding British Forces in Greece reports:—

On the Doiran front our aircraft carried out reconnaissances, during which three enemy aeroplanes were forced to descend behind their lines.

* * *

THE CASUALTY LIST.

Reported Nov. 8th.

WOUNDED.—Hill, Capt. G. D., Hussars and R.F.C.

Ward, Sec. Lt. C. E., R.F.C.

DIED OF WOUNDS.—R.F.C.—Dearing, 9882 1st Cl. Air Mech. F.

Reported Nov. 9th.

KILLED.—Kane, Sec. Lt. F. P., R.F.C.

WOUNDED.—Jones, Lt. C. N., Sherwood For., attd. R.F.C.

MISSING.—Johns, Lt. T. M., Welsh R., attd. R.F.C.

Mann, Sec. Lt. S. W., R.F.C.

Nicholson, Lt. G. H., R.F.C.

Wynn, Sec. Lt. A. E., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS OF

WAR IN GERMAN HANDS.—Burton, Sec. Lt. E., R.E. and R.F.C.

Cairns, Sec. Lt. D. S., Rif. Brig. and R.F.C.

Easom, Lt. A. T., R.F.C.

Gray, Sec. Lt. W. J., R.F.C.

Griffiths, Sec. Lt. F. W., Middlesex R. and R.F.C.

Mase, Lt. H. F., R.F.C.

Pinkerton, Sec. Lt. A. L., R.F.A. and R.F.C.

Sams, Sec. Lt. F. D. H., R.F.C.

Strange, Sec. Lt. M. H., R. Fus. and R.F.C.

Tulloch, Sec. Lt. K. E., R.F.C.

Wainwright, Sec. Lt. B. M., R.F.C.

Wilson, Capt. R. E., Hampshire R. and R.F.C.

Reported Nov. 10th.

WOUNDED.—Wood, Lt. G. H., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND

PRISONERS OF WAR IN GERMAN HANDS.—Bowyer, Sec. Lt. F. H.,

R.W. Surrey Regt., attd. R.F.C.

Elphinston, Sec. Lt. C., R.F.C.

Hewson, Sec. Lt. F. A. A., Border Regt., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF

WAR IN GERMAN HANDS.—Bowring, Sec. Lt. J. V., S. Lancs.

Regt., attd. R.F.C.

DIED OF WOUNDS.—R.F.C.—Brazier, 15699 2nd Cl. Air Mech.

V.; Du Mont, 34555 2nd Cl. Air Mech. S.; Wiltshire, 17243 2nd

Cl. Air Mech. W.

WOUNDED.—R.F.C.—Rideout, 1110 Cpl. A.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN

GERMAN HANDS.—R.F.C.—Irwin, 3389 Sgt. B.; Law, 6537 1st

Cl. Air Mech. L. O.

Reported Nov. 11th.

KILLED.—Turk, Sec. Lt. J., R.F.C.

WOUNDED.—Wallace, Sec. Lt. R. H., Yeomanry and R.F.C.

R.F.C.—Bolton, 6527 Cpl. R. B.; Daley, 12105 1st Cl. Air

Mech. P.; Gall, 7429 1st Cl. Air Mech. C.; Horrobin, 27882

2nd Cl. Air Mech. J. H.; Lamb, 13719 2nd Cl. Air Mech. W.

MISSING.—Anderson, Lt. A., Connaught Rang., attd. R.F.C.

Bentham, Sec. Lt. G. H., E. Surrey Regt., attd. R.F.C.

Cook, Sec. Lt. C. L., A.S.C., attd. R.F.C.

Knowlden, Sec. Lt. W. E., Bord. Regt., attd. R.F.C.

Ordish, Sec. Lt. B. W. A., R.F.C.

Pemberton, Capt. A. J. M., M.C., Leinster Regt., attd. R.F.C.

R.F.C.—Hardinge, 3467 1st Cl. Air Mech. H. A.

Reported Nov. 13th.

MISSING.—Lucas, Capt. Lord, Yeomanry and R.F.C.

Spencer, Lieut. J. M. J., Northumberland Fus. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND

PRISONER OF WAR IN GERMAN HANDS.—Klingenstein, Lieut. G.,

R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF

WAR IN GERMAN HANDS.—Briggs, Lt. L. R., London Regiment

and R.F.C.

PRISONER IN TURKISH HANDS.—Woolley, Capt. C. L., R.F.A.,

attd. R.F.C.

Reported Nov. 14th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND

PRISONER IN GERMAN HANDS.—Taylor, Sec. Lt. J. C., K.O.

Scottish Borders. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN

GERMAN HANDS.—Carmichael, Sec. Lt. W. R. C., Highland Light

Infantry and R.F.C.

Tibbetts, Sec. Lt. J. L., R.F.C.

* * *

Writing on Nov. 11th of a battle between 30 British machines

and about 40 German machines, the "Morning Post" correspondent with the British Army says:—

"The German aviation shows distinct improvement—machine for machine, the enemy's fleet may not fall short of our own—and the pilots evince greater skill and adeptness than they did. It is harder to overcome these periodic outbursts of aggression and hold the invaders in check. Nevertheless, it can be done.

"The battle was won as much by good airmanship as by the work of individual gunners. The German pilots were outmanœuvred.

"The British casualties for the day's work were two bombing machines and two escorting machines missing, one observer killed and two pilots wounded. Of the latter, one managed to alight inside the British lines; the other came down in 'No Man's Land,' and was brought in by the infantry. The seven missing machines referred to in yesterday's official communiqué were the total losses for the day on the entire British front—not in the battle referred to."

* * *

A message was received at Wrest Park on Nov. 9th from the War Office to the effect that Capt. Lord Lucas did not return to the British lines in France after making an aerial reconnaissance over the enemy's position. Lord Lucas, who resigned the Presidency of the Board of Agriculture for war service last year, was appointed a Lt. Commander in March of this year; his Army rank was that of temporary Captain (gazetted in October, 1914), but he had held a Lieutenant's commission in the Hampshire Yeomanry since 1910.

Auberon Thomas Herbert succeeded his uncle, the seventh and last Earl Cowper, K.G., in the baronies of Lucas and Dingwall in 1905. He was born in 1876, and is the second and only surviving son of the Hon. Auberon Edward William Molyneux Herbert and Lady Florence, daughter of the sixth Earl Cowper. Educated at Bedford and Balliol, he was Parliamentary Under Secretary for War from 1908 to 1911, Under Secretary for the Colonies in 1911, Parliamentary Secretary to the Board of Agriculture from 1911 to 1914, and President of the Board of Agriculture from 1914 to 1915.

During the Boer War he acted as a war correspondent and lost a foot. A few months ago he was flying with a pupil when the machine dived, but Lord Lucas escaped. His companion was killed.

When he went up to Balliol in 1895 he became an enthusiastic oarsman. He rowed for his college in the Trial Eights and also at Henley. In 1898 he obtained his Blue, and rowed 7 to Harcourt Gold's stroke, when Oxford easily beat Cambridge in very rough water. He was also in the 1899 boat, which lost.

* * *

Referring to the enemy's renewed activities in re-building his Army in the West, a correspondent with the British Army in a message to the "Morning Post," dated Nov. 8th, says:—

"Aeroplanes of both fighting and scouting types are being manufactured in large numbers in the endeavour to recover the supremacy of the air, and the personnel of the aviation corps has been enlarged.

"German scientists and engineers are labouring on new war machinery—it is quite possible that the British 'tank' will have its counterpart in the new armaments of the enemy—and even this may not be the last word in German skill and ingenuity. The superiority of the British artillery and aircraft in the battle of the Somme has been admitted with frankness, and it must not be thought that the enemy will resignedly accept this handicap and not struggle to overcome it."

* * *

Sec. Lt. F. W. Griffiths, R.F.C., of Caxton Road, Wood Green, has been taken prisoner, and is now in East Prussia. For some time he was on the "missing" list. His parents have now received a letter from him.

* * *

PERSONAL NOTICES.

DEATHS.

BENTHAM.—On Nov. 13th, at Marlborough, an inquest was held on Capt. Richard Bentham, Manchester Regt., who was killed in a flying accident. A witness stated that Capt. Bentham was flying at 2,000 feet when he entered a storm cloud. The engine stopped, and the machine fell rapidly, turning over and over. Just before reaching the ground the engine re-started, and the machine righted itself and began to ascend. Again the engine stopped, and the machine crashed to earth.

Capt. A. C. Clarke, R.F.C., said he could not tell exactly what happened to account for the machine turning over. Probably the pilot lost control in a cloud, partially regained it, and then lost control again owing to giddiness caused by turning round and round in the fall in the cloud. He might not be able to see where he was. He was qualified to fly, and had done 17 hours' flying.

After the accident the controls were found in good order. Capt. Bentham had flown that type of aeroplane several times before. A verdict of accidental death was returned.

* * *

CARRE.—Lt. Edward Mervyn Carré, R.F.C., who was killed on Oct. 16th, aged 22, was the youngest son of the Rev. Arthur

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A. Carré and Mrs. Carré, of the Rectory, Smarden, Kent. Educated at Christ's Hospital from 1903 to 1910, he left as Deputy Grecian and entered the College of the Resurrection, Mirfield, and in 1912 matriculated at Leeds University, whence he obtained an Honour Degree in Classics.

On the outbreak of war he joined the Artists' Rifles and served abroad, receiving a commission in the Lincolnshire Regt. in March, 1915. Being promoted lieutenant, he was transferred to the R.F.C. in May last.

His commanding officer writes:—"We are all very sorry to lose your son. He has done very good work since joining the squadron, and was really one of my best observers." His eldest brother, Maurice Tennant Carré, Australian Infantry, was killed at Lone Pine on Sept. 2nd, 1915. Two remaining brothers, Capt. M. H. Carré, M.C., and Sec. Lt. G. T. Carré, are serving in the Royal West Kent Regt., and have both been twice wounded.

* * *

DAVEY.—Sec. Lt. J. A. Davey, R.F.C., met with a fatal accident on Nov. 8th. He had flown for about 400 yards, when he appeared to lose control of his machine and nose-dived into a shed. The machine burst into flames, and Mr. Davey was found with a fractured skull and severe burns. He was about 19 years of age.

* * *

GILES.—Killed whilst flying in England, on Nov. 11th, Lt. George Edward Giles (Pilot), R.F.C., only beloved son of Maj. and Mrs. G. D. Giles, of Douglas Lodge, Newmarket, and grandson of the late George Barclay, Esq., 17, Coates Crescent, Edinburgh.

A verdict of "Accidental death" was returned on Nov. 13th, at the inquest at Tormarton, near Bristol. Deceased was killed while flying in foggy weather.

Mr. Giles was gazetted Assistant Equipment Officer last June, and afterwards became a Flying Officer.

* * *

LOWE.—On Nov. 8th, on active service, H. Pagan Lowe, D.C.M., Sec. Lt., R.F.C., son of the late R. R. Lowe, of Pernambuco, Brazil, and Mrs. Lowe, 38, King's Gardens, W. Hampstead.

* * *

McKISACK.—Lt. Lawrence Hill Wilson McKisack, of the Lancers, attached R.F.C., met his death on Nov. 13th, whilst making a flight in an aeroplane.

Mr. McKisack obtained his commission in August, being gazetted to a regiment of Lancers, and was afterwards attached to the R.F.C. His home was at Belfast.

MARRIAGES.

BLAKE—HARDEY.—On Nov. 4th, at Lichfield Cathedral, by the Very Rev. the Dean of Lichfield, assisted by the Rev. E. Bradley, Sacrist, Cecil Lyndon, R.F.C., elder son of Capt. H. Lyndon Blake, Resident, Sokoto, Northern Nigeria, West Africa, and Mrs. Blake, Ingledene, Forester Road, Bath, to Margaret Eleanor, twin daughter of the Rev. Montague Hardey, Succentor of Lichfield Cathedral, and Mrs. Hardey, The Close, Lichfield.

* * *

CLIFTON—NICOLSON.—On Nov. 8th, at St. Paul's, Knightsbridge, Edward Noel Clifton, Coldstream Guards and R.F.C., only surviving son of William Edward Clifton, of 12, Cambridge Square, Hyde Park, W., to Nancie Vera Nicolson, of Tile House, Harrow Weald, Middlesex, daughter of James G. Nicolson, of 62, Lymington Road, Hampstead.

The bride was given away by her father, and there were three bridesmaids. Mr. T. D. Spenser, Coldstream Guards, was best man, and Capt. W. L. Robinson, V.C., Lt. F. Sowrey, D.S.O., and Capt. Holmes, all of the R.F.C., and Capt. Finch, Rifle Brigade, acted as ushers.

* * *

MOSLEY-LEIGH.—STIRLING-COOKSON.—On Nov. 7th, at All Saints, Ennismore Gardens, Oswald Edward Stanley, R.F.C., only son of Lt.-Col. Mosley-Leigh, of Belmont Hall, Cheshire, to Mary Eleanor Olive, elder daughter of C. L. Stirling-Cookson, of Houndwood and Renton, Berwickshire.

* * *

WILSON—BANKS.—On the 3rd inst. at St. George's, Catford, Arthur Leslie Wilson, Sec. Lt. R.F.C., youngest son of Mr. and Mrs. Frank Wilson, Vegreville, Alberta, Canada, to Eulalie Minfred, youngest daughter of Mrs. F. F. Banks, of Sydenham.

ENGAGEMENT.

GILL—TREATT.—The marriage of Lt. Rockingham Conyers Gill, R.G.A. and R.F.C., elder son of Mr. and Mrs. Rockingham Gill, of Singlerose, Cole Park, Twickenham, and the Manor of Treverbyn, Cornwall, and Christina Dolores Court Treatt,

daughter of Mr. and Mrs. R. Court Treatt, of 6, Nevern Road, S.W., and the Mill House, Elstead, Surrey, will take place at St. Cuthbert's, Philbeach Gardens, on Dec. 9th, at 12 o'clock. There will be no reception, but all friends will be welcome at the church.

BIRTHS.

FRANCIS.—On Nov. 7th, at a nursing home, Rugby, to Gwynneth (née Black), the wife of Sec. Lt. J. W. Francis, R.F.C., of Dundee, Natal—a son.



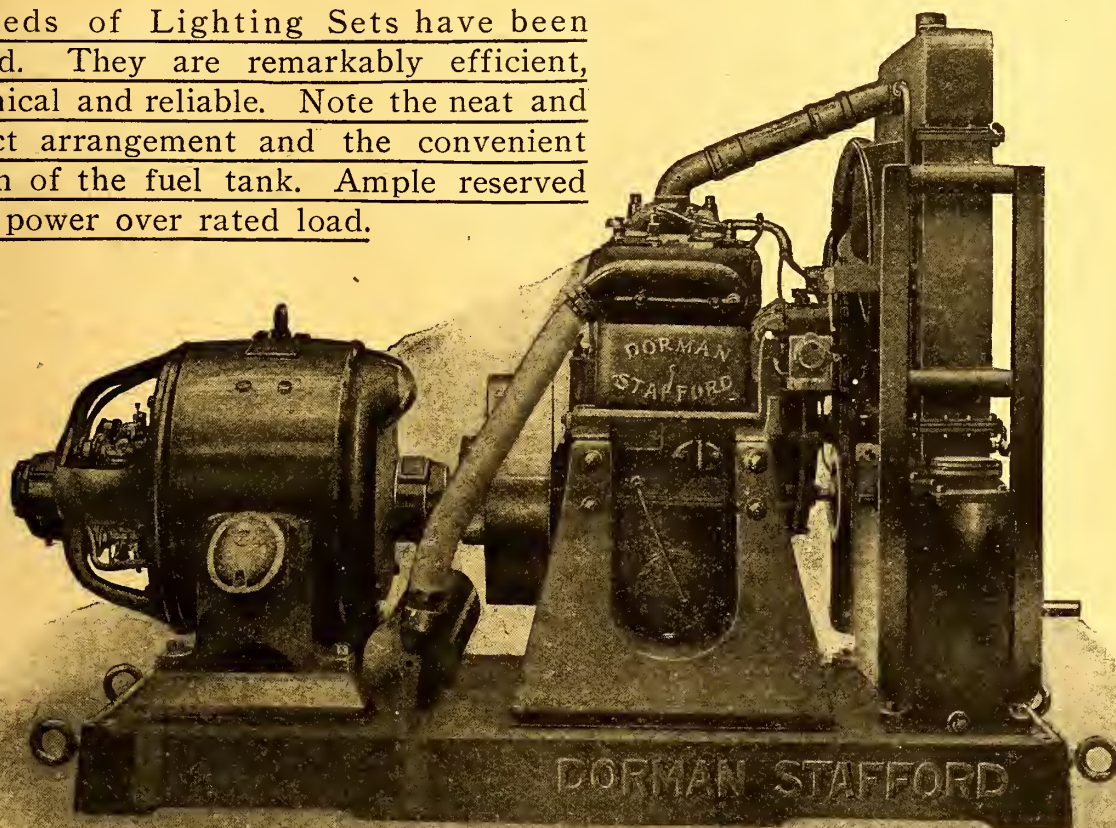
THE PENALTY OF FAME.—A contingent of the R.F.C. in the Lord Mayor's procession.

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FRANCE.

OFFICIAL COMMUNIQUÉS.

Nov. 6th.—In telegrams of yesterday's date the Germans declare that they have shelled Reims as reprisals for an alleged bombardment by the French of inhabited places behind the German front. At no time have the people who are French been subjected to a bombardment by French aviators, who strictly follow the instructions they receive and only drop bombs on military establishments, bivouacs, or enemy railway lines.

Nov. 7th.—German aircraft dropped several incendiary bombs on Nancy yesterday towards 10 p.m. There were no victims and no damage was done.

ARMY OF THE ORIENT.—Our aeroplanes bombarded several localities in the valley of the Vardar. An enemy aeroplane was brought down near Monastir during a fight with one of our pilots.

Nov. 8th.—North-west of Pont-à-Mousson two enemy aeroplanes were brought down in air fights by our pilots—one near Viéville-en-Haye, and the other in the direction of Vilcey-sur-Trey.

On Monday night eight of our bombarding aeroplanes dropped 1,200 kilogrammes (nearly a ton and a quarter) of projectiles on the aerodrome of Frescaty (Metz), and 1,200 kilogrammes on the military railway station of Chambley (south-west of Metz). The objectives were struck.

ARMY OF THE ORIENT.—Our aeroplanes bombarded the enemy encampments in the region north of Monastir.

Nov. 10th.—There was great reciprocal aviation activity yesterday.

Our aeroplanes engaged in 77 fights, in the course of which a Fokker biplane was brought down in our lines near Aubérive, a Rümmler was forced to descend near St. Hilaire-le-Grand (both east by south of Reims) (the two aviators are prisoners), another machine was certainly brought down, and seven came down in the German lines on the Somme.

Our bombarding squadrons dropped 700 bombs or shells on the communications and cantonments behind the front, especially on the railway stations of Lens and Vouziers (north-east of Reims), and 270 bombs on the blast furnaces of Algrange, near Thionville, the aerodrome of Dieuze (north-west of Saarburg), the railway station of Courcelles-sur-Nied, and the aircraft sheds of Frescaty (respectively south-east and south of Metz).

ARMY OF THE ORIENT.—British aeroplanes bombarded the stations of Porna and Fotolivo (on the Seres-Drama railway).

Nov. 11th.—Three German machines were brought down by our pilots in the region of the Somme. Two of these were brought down by Lt. Guynemer, one south of Nesles and the other near Morcourt. These bring up to 21 the number of enemy machines

destroyed up to the present by this pilot. Two other German machines attacked by our aircraft came crashing to the ground, the first in Champagne, north of Aubérive, and the second in Lorraine, south of the Forest of Gremecy, where it fell in flames.

On Thursday our bombarding squadrons dropped 2,205 kilogrammes (over 2½ tons) of explosives on enemy railway stations, bivouacs, and parks on the Somme front.

One of our machines flew over the Rhine between Neuf Brisach and Strasbourg, and dropped six bombs on the railway station of Ofenbourg, which sustained serious damage.

Between 10 and 11 o'clock in the morning of Nov. 10th a group of 17 British aeroplanes bombarded the steel works of Focklingen (north-west of Saarbrück). 1,000 kilogrammes (about one ton) of projectiles were dropped on the buildings, which suffered great damage. In the course of the operation the British aeroplanes fought several actions against enemy machines, of which three were brought down.

The following night, between eight and nine o'clock, eight of our aeroplanes carried out a fresh bombardment of these factories, in the course of which 1,600 kilogrammes (over 1½ ton) of projectiles were dropped. Several fires were observed. All our machines returned safely.

During the night of Nov. 10th-11th our squadrons rained projectiles on the stations of Ham, St. Quentin, Tergnier, Nesle (in the Somme region), the aerodrome of Dieuze, the blast furnaces of Romsbach, the aerodrome hangars of Frescaty, and the blast furnaces of Hagondange. These operations caused great damage to the enemy.

German aeroplanes during the night of Nov. 10th-11th bombarded several French towns. Nancy and Luneville received projectiles which caused no damage and inflicted no casualties. The open town of Amiens was also bombarded on different occasions during the same night. Nine persons of the civilian population were killed and 27 were injured.

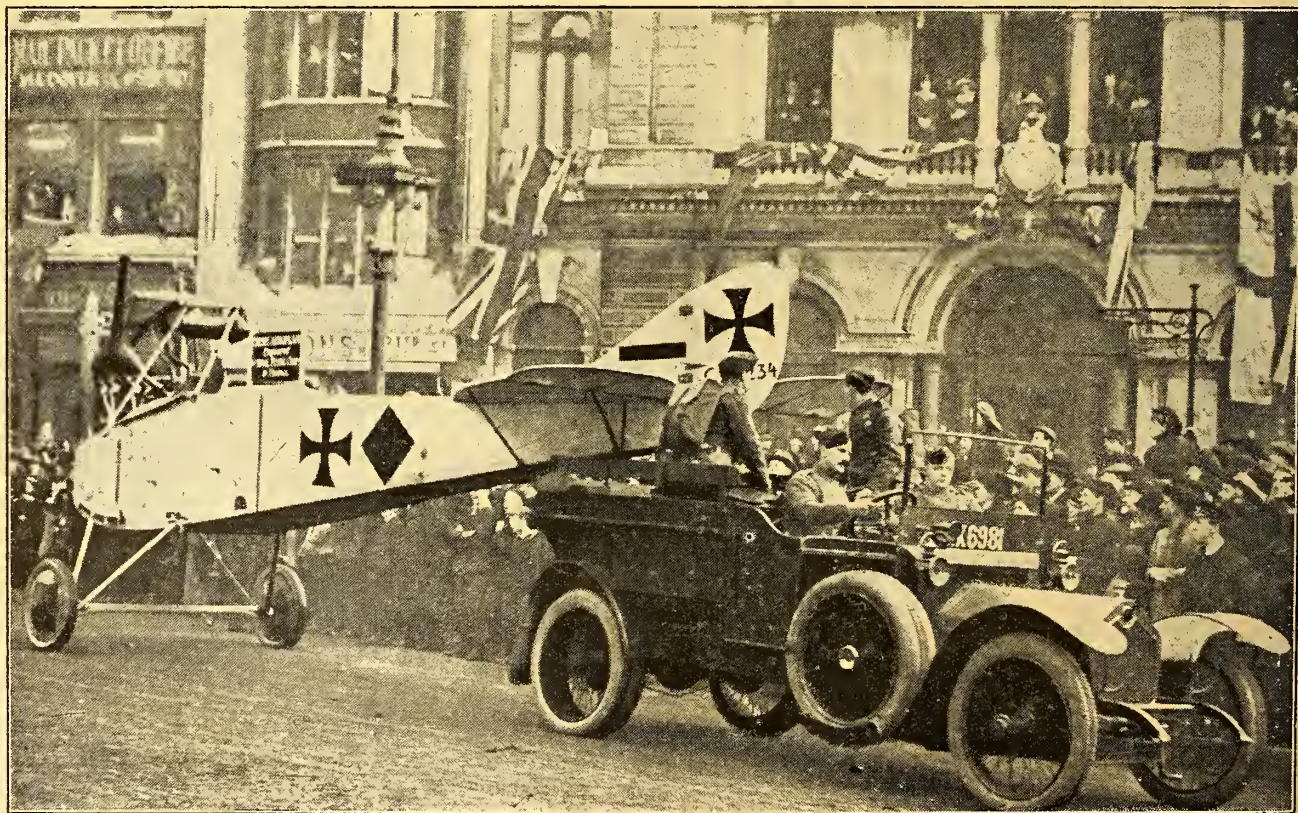
Nov. 12th.—Lt. Herteux yesterday brought down his 12th aeroplane. The German machine fell in flames to the west of Sailly Saillisel. It is confirmed that Lt. Deulin on Friday brought down his ninth enemy machine to the east of Péronne.

It is confirmed that Adjutant Bonnetoy brought down on Nov. 4th his fifth German machine.

Nov. 13th.—Nine bombarding aeroplanes and seven escorting aeroplanes of the British Royal Naval Air Service bombarded the blast furnaces and foundries of St. Ingbert, north-east of Saarbrücken, in the basin of the Sarre.

All the machines returned.

Two German machines last night dropped bombs on Belfort. Five civilians were wounded.



A TROPHY.—An enemy biplane, apparently an L.V.G., being towed in the Lord Mayor's procession.

To Aircraft Constructors and all Interested in the Aircraft Trade

The manufacturers of Titanine Dope desire to call the attention of those interested to the fact that they have consistently advocated the adoption of non-poisonous Dopes, and would respectfully point out that Titanine is the best known and most efficient of such Dopes. They invite and welcome any opportunity for comparative tests.



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Telephone: Gerrard 2312.

Telegrams: "Tetrafree, Fen, London"

Or to Head Office:

MILBURN HOUSE, NEWCASTLE-UPON-TYNE

Telephone: Central 2263.

Telegrams: "Tetrafree, Newcastle-upon-Tyne"

On Nov. 10th the "Morning Post" made the following remarks on the situation at present obtaining in France:—

"Apart from the difficulty of movement, the action of the artillery in co-operating with the infantry attack, which is largely dependent for its effectiveness on the observation of fire from aeroplanes, is liable to be hampered by rain and mist, which cause low visibility, while even when the weather is clear the high winds which have prevailed have been unfavourable to the employment of aircraft either for observation or reconnaissance. The guns have thus been deprived to some extent of the eyes on which they depend for effective action, and the infantry advance has consequently been limited to such short distances as admit of the guns playing their part without being kept in close and constant touch with the progress of the attack. The Germans have, in fact, been compensated for their inferiority in the air on account of the Allies having been deprived of much of the advantage they derived, in better conditions of weather, from their supremacy in that element."

* * *

The "Morning Post" correspondent in Paris in an article dated Nov. 9th says:—

"While the French troops deserve the highest possible praise for the brilliance of their attack, it is worth emphasising that once again the artillery and the aviators have been conspicuous for the value of the services rendered. They have been working for the last fortnight under peculiarly difficult conditions, the aviators in particular having had to battle against rain and violent gales. Despite this they have succeeded in directing the artillery fire to such good effect that when the effort was asked of them the infantry were able to carry out their task with substantial results."

Later he adds:—"The wind was so strong that only a few of the French aviators had ventured up, and it goes without saying that there was no German aeroplane to be seen."

* * *

M. Georges Carpentier, the celebrated boxer, who is fighting on the Verdun front, has received the Médaille Militaire for services rendered during the attack on the Fort of Douaumont.

GERMANY.

OFFICIAL COMMUNIQUÉS

Nov. 7th.—A German air squadron, in a night bombing attack, set on fire large ammunition depots at Cérisy, south-west of Bray. Continuous and formidable detonations were felt as far as St. Quentin (about 30 miles west-by-south from Cérisy).

Nov. 8th.—On Monday night a German air squadron attacked a French military camp in the valley of the Close, west of the Bois Ocessaire, and in the Bois Celestine, north of Cérisy, on the Somme. Good results were observed in the tents and barracks, where conflagrations broke out.

On the same night another German squadron attacked the great ammunition station at Cérisy, where long goods trains were standing. This station, which is the centre of the French ammunition supply, and the surrounding ammunition depots were set on fire. The flames spread to the whole of the big ammunition depot, which was blown up by a series of explosions. The scene of the conflagration and the searchlight positions were attacked by our brave aviators with machine-guns, and great clouds of smoke were noticed over the place, and were encountered by our aviators at a height of about 3,000 ft.

Other German air squadrons on the same night bombed about 20 enemy positions behind the enemy's front where Russian soldiers were billeted. Numerous conflagrations were observed. The railway works near Preyart, Amiens, and Longueau were damaged by bombs. On the line Amiens-Pont de Metz a bomb weighing 112 lb. destroyed a moving train.

Nov. 10th.—The activity of aviators, which has been very lively throughout the day, was continued in the clear moonlit night.

During the course of numerous air engagements we brought down 17 enemy machines, most of them on both sides of the Somme.

Our squadrons repeated their effective attacks on railway stations, troop encampments, and munition dumps, especially in the region between Péronne and Amiens.

Nov. 11th.—Clear autumn weather favoured artillery and aerial activity on both sides.

Nine civilians fell victims to a bombing attack by enemy aviators against places behind our front. The military damage done was small.

Ten more enemy aviators were brought down yesterday in air-fighting and by our anti-aircraft fire.

Nov. 13th.—Between 9.30 p.m. and 10.30 p.m. on Friday hostile aeroplanes attacked a number of places and factories in the Saar region. As the bombs dropped fell in some cases in open country, and in others did not explode, only small material damage was done. There was no military damage whatever. Various dwelling-houses were struck at Burbach. One inhabitant was

killed, and one badly wounded, and two slightly. At Dillingen two persons were slightly injured. At Saargemünd a house was destroyed by an aviator who had lost his way, two inhabitants being killed and six slightly injured.

The attack on places and factories in Lorraine, which was made the same day shortly before midnight, was entirely unsuccessful.

The same night our air squadrons threw over 1,000 kilograms (over a ton) of bombs on Lunéville, Nancy, and the aerodrome at Malzéville (adjoining Nancy). On the Somme our bombing squadrons the same night dropped some 6,000 kilograms (about six tons) of bombs on railway stations, municipal depots, troop shelters, and aerodromes of the enemy. The success of the attack could be seen by great fires, which were visible for a long time.

RUSSIA.

OFFICIAL COMMUNIQUÉ.

Nov. 8th.—In the wooded Carpathians, west of Tartarow (north-east of the Jablonica Pass), an aerial fight took place between one of our aeroplanes and an enemy machine. Our machine was brought down and the airman, Sub-Lt. Lagutenko, perished. The condition of the observer, Non-Commissioned Officer Waitzman, is hopeless.

It is reported from Petrograd that enemy aeroplanes recently attempted to attack the Russian Black Sea fleet, but were driven off.

* * *

At the mouth of the Danube a Russian warship brought down an attacking German aeroplane. The pilot and an officer were taken prisoners.

AUSTRIA.

OFFICIAL COMMUNIQUÉ.

Nov. 8th.—Yesterday afternoon enemy aviators bombed the towns of Rovigno, Parenzo, and Citta Nuova (on the Istrian coast) without causing the least damage. There were no casualties. Our aviators went up in pursuit and shot down an enemy aviator, who came down near some enemy torpedo-boats on the open sea. These were attacked with bombs by our aviators and steamed off towards the enemy coast.

"Army Front of the Archduke Karl.—Near Tartarow an Austro-Hungarian airman shot down a Russian Nieuport biplane."

ITALY.

OFFICIAL COMMUNIQUÉS.

Nov. 8th.—Yesterday afternoon squadrons of Italian and French aircraft carried out an offensive reconnaissance on the enemy coast. Bombs were dropped with good results on the aviation station at Parenzo-Istria and on craft used for military purposes in the harbour of Cittanuova. In spite of the violent fire of the anti-aircraft defences and of a counter-attack by enemy seaplanes, all our machines returned safely. Enemy seaplanes dropped several bombs without any effect on some of our torpedo-boats, which also returned safely to their base.

Enemy aircraft dropped bombs on the usual localities on the Lower Isonzo, killing two people and wounding a few others.

One of our seaplanes bombarded enemy works at Salvore point, at the entrance of Pirano Bay.

Nov. 9th.—Enemy aircraft dropped bombs near Monfalcone, killing a man and wounding a few others.

Nov. 13th.—On the night of Nov. 11th a squadron of enemy aeroplanes dropped bombs on Padua. A building where numerous women and children had taken refuge was destroyed, with the result that the greater part of them were killed. The number of dead ascertained already amounts to 60.

ROUMANIA.

OFFICIAL COMMUNIQUÉS.

Nov. 8th.—Southern Front.—Enemy seaplanes attacked Sulina. One machine was brought down and captured, with its pilot and observer.

Nov. 9th.—In the upper valley of the Asual (? Uzul, Moldavian front) our troops brought down an aeroplane of the Hindenburg type. We captured the pilot and observer.

[Presumably this is merely a mistransmission for "Brandenburg."—Ed.]

An official report has been presented by Professor Jean Cantacuzene and the Director of Bacteriological Institute at Bukarest upon their examination of the sweetmeats dropped by German aviators and spread over the city by German spies. Experiment showed these to contain disease-producing bacilli, including those of typhoid fever and infantile complaints. In the flasks discovered at the German Legation were found cultures of morve (glanders) and a very virulent form of anthrax.

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Special List of STANDARD A.G.S. PARTS

(For Aircraft of R.A.F. or Private Design)

Fully Illustrated Compiled by BERNARD ISAAC

OUR SPECIAL LIST OF A.G.S. PARTS (R.A.F. Aeroplane General Sundries) will be published shortly. In response to manufacturers' suggestions, we have decided to make this list very much more comprehensive than was intended, and the issue has been slightly delayed. This will contain about 48 pages, and will include all the most important items.

Each part will be ILLUSTRATED by reproductions of actual PHOTOGRAPHS and blue print DRAWINGS. SPECIFICATIONS, FITS and LIMITS, complete DIMENSIONS and R.A.F. MATERIAL specifications of all mark numbers will also be given.

This LIST will form a valuable work of reference for Aircraft Manufacturers, Engineers, Designers and Storekeepers; for those interested in, or connected with, the Aircraft Industry and the Air Services; and most useful for REFERENCE in connection with our regular WEEKLY and MONTHLY STOCK and QUOTATION LISTS.



OUR NOVEMBER LIST

A STOCK LIST PAGE

A.G.S. AIRCRAFT PARTS, although principally used on R.A.F. Aircraft, are now extensively embodied in machines of PRIVATE DESIGN by many Manufacturers. It is anticipated that the A.G.S. STANDARD for Aircraft Parts will be UNIVERSALLY ADOPTED by the AIRCRAFT INDUSTRY, thus considerably reducing the immense number of various types of small parts it is now necessary to stock in the R.F.C. and R.N.A.S. Stores.

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(A.G.S. 137)

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APRIL 1971
(See our Weekly Stock List for Prices, Stock, and Delivery.)

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THIS IS A SPECIMEN PAGE of our SPECIAL LIST OF A.G.S. PARTS to be published on November 1st, next. This will contain about 28 pages and will include all the most important items. Each part will be illustrated by reproductions of actual photographs, and blue print drawings. Complete dimensions and R.A.F. Material Specifications of all mark numbers will be given.

This List will be of great value to Aircraft Manufacturers, Engineers, Designers, Storekeepers, and members of the Air Services, and most useful for reference in connection with our regular Monthly Stock List. Copies may be had free on application when ready.

For Prices, Stock and Delivery of Pins see page 9.

AN A.G.S. PAGE
EVERY PART
FOR AIRCRAFT

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NOVEMBER ILLUSTRATED STOCK AND QUOTATION LIST (No. 27—32 pages) and Weekly Supplement (No. 27B), issued Monthly in future, on the first Wednesday in every month, with Weekly Supplements.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

BULGARIA.**OFFICIAL COMMUNIQUÉ.**

Nov. 7th.—Enemy aviators displayed lively activity, but without effect, behind our front.

GREECE.

It is reported from Petrograd that on Nov. 7th a British aviator arrived at Reni, having flown from the Greek islands near the Dardanelles to the Dobruja.

* * *

A Salonika telegram says that two men belonging to the crew of the Zeppelin which was brought down near Salonika on May 5th managed, although wounded, to escape from the marshes of the estuary of the Vardar and cross the frontier into Bulgaria.

AN "ANTI-ARCHIE" GUN.

In a recent issue of *THE AEROPLANE* there appeared a couple of illustrations and a description from an American source of that interesting American invention the Davis quick-firer. It may be well to recall that this gun has two barrels pointing in opposite directions, and operated from a common breech-chamber in the middle. The idea is that a shell is fired from one barrel, and that the recoil is taken up by the discharge of an equal weight of dust-shot from the opposite barrel, so that no recoil whatever is felt.

When the notes above mentioned were published the opinion was expressed that the lightness of the gun would probably be annulled by the fact that it was necessary to carry a double-weight cartridge, the dust-shot charge being equal in weight to the shell, and the powder charge having also to be of double weight, and also it was suggested that any error in the manufacture of the cartridge might produce dire results owing to one charge escaping more easily than the other. Since then I have had the opportunity of learning considerably more about the Davis gun, and I confess that my opinion as to its drawbacks has altered very materially.

The principle of the earlier type of gun is quite familiar to every German in the United States who is concerned with this class of armament, and it would be under-estimating the German Secret Service to assume that Germany does not possess samples of the material from which the gun is made. Nevertheless, just because the makers of the gun happen to be vigorously pro-Ally, Germany has not got any of the guns, does not know the precise trick which enables the gun to be made at its present weight, and is not in the least likely to learn. That is a well-kept trade secret, which is a better safeguard than any patent, even in peace.

The latest type Davis gun is a very distinct advance. By a very simple device it is now possible to diminish the weight of the cartridge used even in the old type gun by nearly a half, and so to enable the gun's attendant transport to carry many more rounds. And the new gun weighs very considerably less than the old type, despite the fact that the old one was itself a revolution in gun weights.

Naturally, it is not permissible to give any weights or figures concerning the gun or its projectiles, but flying officers who have experimented with anything heavier than a Lewis or Vickers in an aeroplane will easily appreciate the benefits of a gun which

can fire real shell without any recoil whatever. Those who have been continually "Archied" without the ability to reply, except by coming down within range of machine-guns, will also appreciate the possibilities of a gun which would enable them to hit back with a sporting chance of doing "Archie" as much harm as he can do to them. An "Anti-Archie" squadron should be popular at the Front.

The ability to carry a field-gun in an aeroplane of fairly ordinary size would doubtless be comforting to many R.F.C. officers, not to mention R.N.A.S. officers who endeavour to sink enemy destroyers and submarines with bombs dropped by gear and sights of problematic accuracy. I can see no good reason why results as effective as those of a field-gun cannot be obtained with the Davis gun when properly fitted, and used intelligently.

For obvious reasons I cannot say where these guns can be seen and handled in England, but if officers in the Flying Services want to learn more about the matter I shall be pleased to put them in touch with the man who knows all about it if they care to write to me personally, and I take it that as they would be asking information from, and not conveying information to, the Press, they would in no wise infringe King's Regulations by doing so.

—C. G. G.

SPORT AT THE SOPWITH CLUB.

The headquarters of the Sopwith Athletic Club, situated in Fife Road, Kingston, were well filled on the evening of Nov. 11th, when a boxing and variety entertainment was given under the patronage of Messrs T. O. M. Sopwith and R. O. Carey, the proceeds of which will be handed over to the British Sportsmen's Motor Ambulance Fund. The following account of the contest is taken from "The Sporting Life":—

The boxing portion of the proceedings, arranged by Percy Parber, produced some excellent sport, the first item being a six-rounds contest between Harry Lynch, of Bermondsey, and Jim Quarrell, of Walworth. After a rather quiet start, the men settled down to their work in resolute fashion, and while Lynch showed excellent form with his left hand, Quarrell was at times very successful at close quarters. Lynch, however, managed to keep his end up, and eventually won a capital bout.

The second item was of ten rounds, between Sid Whatley, of Walworth, and Darkey Saunders, of Camberwell, of whom Whatley was many pounds the heavier, and also had about three inches advantage in height. This notwithstanding, Saunders stood up pluckily to his work, and although he was repeatedly running up against a good left hand, he was never tired of trying. Whatley, in addition to being the quicker in his leads, showed a deal of cleverness with his head, and in the end won a fine bout.

Spier's Midgets gave a four rounds exhibition bout, which greatly delighted the company.

During the proceedings a collection was made for the Fund, which realised £5 os. 6½d.

Referee, Mr. J. T. Hulls ("Sporting Life"); timekeeper and M.C., Mr. George Harrington; seconds, Alf Denhart and Sam Woodley.

The boxing contest was followed by an entertainment, which was opened by selections by the Sopwith Orchestra. This was followed by a song by Miss M. Read, who professionally is a most capable acetylene welder, and is in her spare time an equally capable vocalist. Mr. Walter Morling sang a comic song with great effect, and Messrs. T. Evans and T. Smith produced a comic operetta. After a duet by Miss M. Read and Mr. H. Fisher the proceedings were terminated by a selection from the "Bing Boys" by the orchestra. Altogether the evening was a huge success.

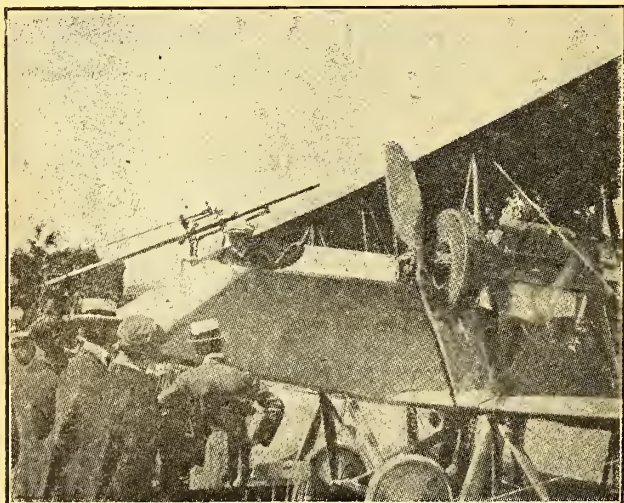
THE LORD MAYOR'S SHOW.

On Nov. 9th the traditional procession signalling the accession of the new Lord Mayor of London wended its way along the old-time route. Naturally, the new Chief Magistrate occupied the chief post of honour, but the late Lord Mayor, Sir Charles Wakefield, well known as of Wakefield House of Castrol fame, received well-deserved acknowledgment from the crowd for the work he has done during his year of office.

The procession included a detachment of R.N.A.S. Air Mechanics carrying rifles, and a detachment of the R.F.C. bearing packs. A "B.E." biplane, with fuselage trailing behind a car, and its wings upon a truck led the way for a captured enemy biplane, apparently an L.V.G., carried in a similar manner, which was received with humorous abuse by the crowd.

WHEN THE ENEMY WANTS THE TRUTH.

Among the relics saved from one of the Zeppelins recently destroyed in this country, says the "Horological Journal," was the commander's gold watch. It was considerably damaged, but the engraved inscription within the outer case remained, and read, "Made in England."



The Davis gun mounted on a twin-engine Curtiss tractor, showing the recoil-barrel projecting upwards and rearwards. The gun has been used with remarkable success in the States.

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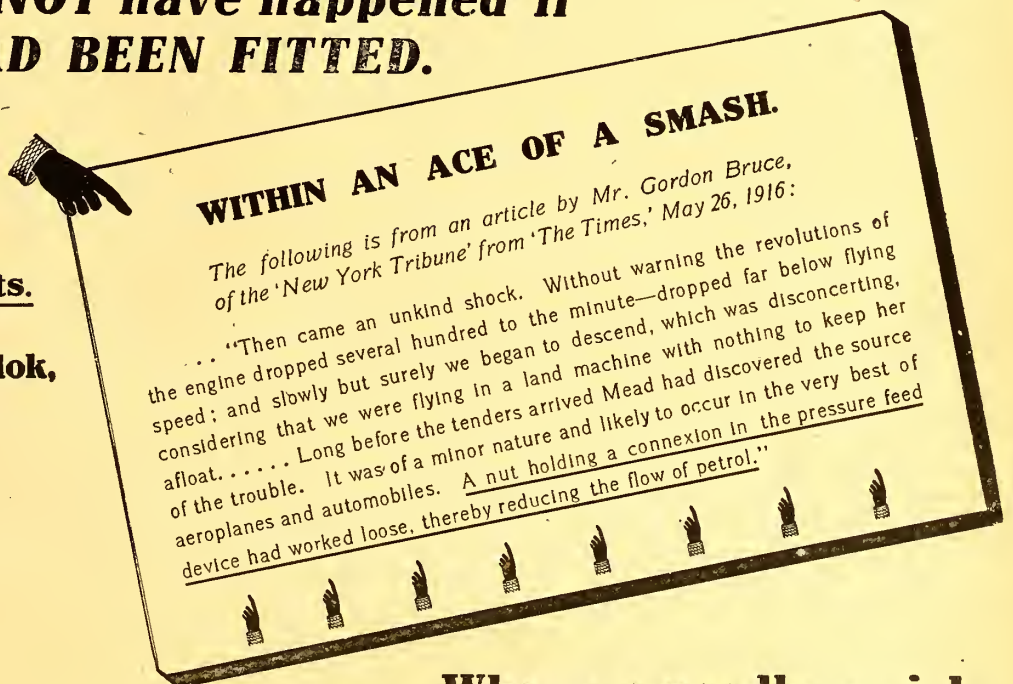
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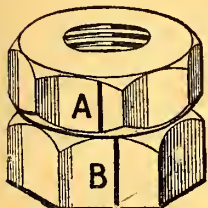


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Mr. W. J. SMITH, C.E., Engineer and Surveyor, Market Harborough, writes on May 8, 1916:

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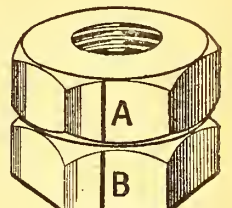


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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

QUESTIONS IN THE HOUSE.

On Nov. 7th, replying to **Sir E. Cornwall** (R., Bethnal Green, N.E.), **Mr. Asquith** said the functions of the existing Air Board were fully explained to the House in May last. They included the task of organising, co-ordinating, and supplying material to all the Air Services. The Government had just received the first report of the President of the Air Board. It was receiving their most careful consideration, and he hoped would be published very soon.

On Nov. 8th, **Mr. Asquith**, answering an inquiry by **Mr. Joynson-Hicks** whether the time had come to confer additional executive powers on the Air Board, as foreshadowed at the time of its formation, referred to a reply given by him yesterday to a question on the same subject, and added:—The Government has just received the first report of the President of the Air Board in which certain suggestions and recommendations are made, which are receiving our most careful consideration.

Major Hunt (Ludlow, U.): Is the right hon. Gentleman aware that the Air Board will not go on unless it has full powers? **Mr. Joynson-Hicks**: Has not that report been in nearly three weeks now, and will the right hon. Gentleman expedite its consideration? It is very important. **Mr. Asquith**: Nobody is more alive to that than I am.

Mr. Asquith, asked by **Mr. Hogge** and **Sir E. Cornwall** (Bethnal Green, N.E., L.), whether compensation for losses, as regards persons and property, caused by Zeppelin raids would be made a national liability, said:—The Government have this suggestion under consideration, but I cannot yet make a statement on the subject.

Mr. Middlemore (U., Birmingham, North) asked the **Secretary to the Admiralty** whether any air raids had been made, or attempted, on the German coast other than those of Dec. 25th, 1914, and March 25th, 1916.

Mr. Macnamara: Other attempts have been made than those referred to by my hon. Friend, but owing to weather conditions they have not been successful.

Mr. Middlemore: Is the statement correct that appeared in the German Press that there was a British raid on Oct. 22nd?

Mr. Macnamara: I cannot say; I do not know the statement referred to.

On Nov. 9th, **Mr. Bonar Law**, asked by **Mr. Pemberton-Billing** whether, in view of Lord Curzon's recent report on the Air Service, the Prime Minister would consider the paper dealing with the creation of an Air Minister and an Imperial Air Service handed to him by that member on April 12th, said:—Lord Curzon's report is a confidential document, and I cannot accept the hon. member's description of it. The whole subject is being fully considered.

Mr. Billing: Would the right hon. Gentleman mind inquiring whether the paper which I handed personally to the Prime Minister has been considered? **Mr. Bonar Law**: I have no doubt that it received the consideration it deserved. (Laughter.) **Mr. Lynch** (Clare, W., Nat.): Is it not a fact that the chances of the Allies are being injured by putting up such a wretched organisation as the Air Board, and is it not time that the whole question should be grappled with in a masculine spirit? (A laugh.) **Mr. Bonar Law**: That must be a matter of opinion, and I am not prepared to express one just now.

THE PARLIAMENTARY AIR COMMITTEE.

Members of the Parliamentary Air Committee paid a visit on Nov. 10th to Hendon. They included the Chairman (Col. Wilfred Ashley), Lord Oranmore and Browne, Lord Leigh, Mr. Joynson-Hicks, Mr. Cecil Harmsworth, Lord Saltoun, Mr. Bird, Sir Albert Spicer, Sir Stuart Coats, Earl Russell, Maj.-Gen. Sir Ivor Philipps, Lord Saye and Sele, Sir Clifford Cory, Maj. Pretymann Newman, Mr. de F. Pennefather, Col. John Grettton, Lord Aberdare, Mr. Frank Perkins, Sir John Rees, Mr. Hogge, Lord Peel, Sir Charles Henry, Sir C. Kinloch-Cooke, Mr. Shirley Benn, Mr. Herbert Nield, Commander Carlyon Bellairs, Mr. G. H. Morgan, Mr. Cowan, Sir E. Beauchamp, Mr. Warwick Brookes, Lord Hardwicke, Maj. Rowland Hunt, Mr. McLaren, Mr. Timothy Davies, Lord Leith of Fyvie, Col. Sir Hamar Greenwood, Mr. Byrne, Mr. Bowerman, and Capt. Alan Burgoyne and Mr. T. Comyn Platt (hon. secretaries to the Committee).

The party first toured the works of the Aircraft Mfg. Co., Ltd., which is turning out aeroplanes of widely diverse design. A visit was also made to an aerodrome, where sundry members of the Committee flew on machines of the latest type.



Photographs by F. N. Birkett, 197, Percy Road, Shepherd's Bush, W.

SOME BEATTY PUPILS.—Mrs. C. E. Wilkinson, Messrs. G. le Champion, H. W. M. Hoskins, F. W. Knox, — Jones, J. A. Davy, A. W. Kay, B. J. Earl, R. H. New, V. G. Austen, B. Roberts, W. A. R. Murdoch, P. S. W. Witmore, H. E. Martin, R. A. Phillips, G. W. Dowding, B. J. Curry, W. G. Edwards, A. W. Wood, D. Mitchell, G. McPherson, P. Rudd, H. J. H. Garlick, J. W. Towson, J. S. de Wilde, C. W. Skeet

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The Way of the Flight-Sub-Loot.

[In the following article an attempt has been made to give the aspirant-aviator some idea of what will be expected of him before he reaches that beatific stage in which he is entitled to wear many stripes on his sleeves and to decorate his manly breast with multi-coloured ribbons. It is an Englishman's privilege to grumble, and, if our author appears to do more grumbling than need be, the mere fact that a probationer has survived the trials at which he grumbles probably makes that probationer a better man afterwards. At the same time, some of the causes of complaint might be removed with advantage, and it is hoped that they will be investigated by the right people. Also it is well to note that the same complaints do not arise at every or all training centres.—Ed.]

There are doubtless many readers of this journal who contemplate, or at any rate hope for, a commission in the Royal Naval Air Service. To such folk, and maybe to many others who are interested, the writer hopes that in this article knowledge may be obtained, possible fears mitigated, and any uncertainties as to one's fate after being gazetted at once dispelled.

In the first place, after once making application to the Air Department, Admiralty, and then pegging away for several weeks in order to be invited to appear before the Selection Committee, the enthusiastic "airman-to-be" will, if lucky, receive a very curt appointment sheet which reads briefly—as follows, viz.: "The Lords Commissioners of the Admiralty hereby appoint you Probationary Flight Sub-Lieutenant of His Majesty's Air Station C— P—, etc." [In these days it is Prob. Flight Officer.—Ed.]

Continuing, he is told to report there probably within three or four days of receiving the note, during which time he must hustle around and provide himself with a uniform and kit, a description of which is enclosed with the appointment sheet. If the candidate lives in the country, a very excellent plan is to call on a reputable London tailor to be measured for a uniform on the day on which he attends the Selection Committee. He can always arrange to wire them immediately he hears from the Admiralty if his application has been successful as to whether they should proceed in executing and dispatching the order. By this means much subsequent annoyance and disappointment will in all probability be avoided.

Local tailors may be excellent in their civilian work, but the writer has seen too often the weird results of their attempts to make a naval uniform for the first time. London tailors are to be found who are excellent in their work and moderate in price, and above all, with a desire to satisfy their customers. It is not by any means necessary to go to any particular firm which happens to be recommended by people at the Admiralty.

Whilst on the subject of clothing the following remarks will

be of interest. For the first few weeks a "prob. sub-loot" need not give himself the trouble of providing and carrying about either a flying coat or cap. No matter what flying school he may be sent to, he will find that these articles may be borrowed from the Naval stores. It is usual, however, to have one's own flying cap, this at least being a garment of which one prefers the sole and exclusive use.

Similarly for a period of three weeks before he goes to a flying school he will need neither breeches nor puttees. Indeed, these may not be required for several months, this being solely dependent on the regulations of the school to which the probationer is appointed.

A part of the uniform which is too often missed, however, is the strict necessity for proper Service boots. These are in all respects like ordinary black footwear, save that they are without toecaps, the front being quite plain. This is a point in naval dress which is very little known.

HIS FIRST AIR STATION.

Leaving aside such sordid details as these preceding, we will now suppose that the erstwhile candidate has been appointed to, and has arrived at, his first Air Station. Bursting with enthusiasm and a passionate desire to battle with the Huns of the air, he will be greatly disappointed on arrival to learn that no flying will be his portion, and that he is on the station almost solely for the purpose of imbibing discipline and drill.

He remains on the station three weeks, during which time he learns thoroughly the meaning of the word "probationary," and also that his status while in this unlovely state is much akin to that of an A.B. on the lower deck who has the good fortune to be serving with the Grand Fleet.

Unless he has been accustomed to marching twenty miles per day over loose road metal and Welsh mountains, he will also learn how one feels when troubled with skinless feet and a ten ton body at the same time. Celerity of movement is very much desired. When moving from ease to attention, with instructor on the left, it is necessary to touch one's right foot with left even before the order has carried on to one's right-hand neighbour.

Truly the Air Service is wonderful. Many years ago some old general—in peace time, of course—said that the only way to teach men discipline was to give them squad drill, squad drill, squad drill until they were only able to lie on their backs and whisper curses—then give 'em more squad drill.

As this idea is many years old the Air Service is now using it, and to the poor, miserable flight sub-loot it is explained, expounded, and experimented in full detail. Happily, this continues for three weeks only, when the long hoped for transfer to a flying school takes place.



(Photograph by F. N. Birkett, 97, Percy Road, Shepherd's Bush, N.W.)

SOME RUFFY-BAUMANN PUPILS:—Messrs. J. de Balmé, J. Elgar, D. E. Hackness, Keith Muspratt, Philip Wood, M. Johnstone, W. Barnes, Wilson, J. Durrand, J. Beebe, A. Thom sen, G. Straus.

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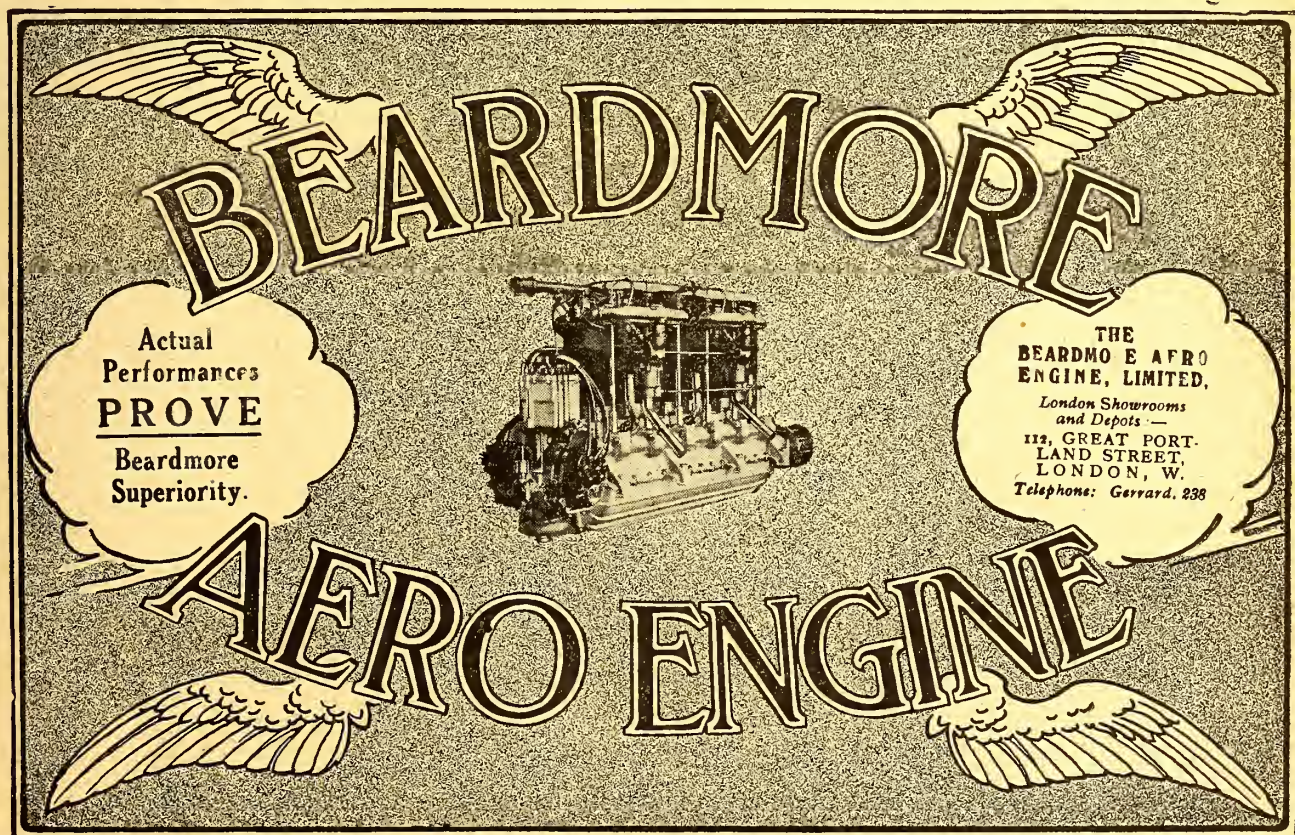
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If this is a journey of ten miles distant, the train selected for him by the chosen mighty, otherwise the Temporary Staff, will probably be an express, which does not stop there—if two hundred miles away he will assuredly travel by the locals, in order that he may have the pleasure of seeing a later express overtake him when about three-quarters of the journey has been suffered.

AT THE FLYING SCHOOL.

At the flying school another glaring disappointment awaits. The first fortnight, at least, instead of being spent in the air, either here or in France, is spent in an engine shop, containing probably about seven vices, three screwdrivers, a blow lamp, and a stove, where wonderful renovations are practised on the engines of the station aeroplanes.

During that fortnight, theoretically, one is made into a mechanic and engineer. At the end of the next seven days one is a carpenter also. Smart, is it not? Strangely reminiscent of "How to become a sailor in a month," by T. B. D. Blank, of the Royal Naval Motor Boat Reserve.

Our pilgrim has now therefore, become an engineer, a carpenter, and a drill expert all within three to six weeks. It only remains to make him an aviator, apparently the least important of all points. This, at any rate, is the unfortunately cynical line on which his thoughts will run whilst suffering the agony of that first few weeks.

On being told off for instructional flying he at once commences to spend all his evenings on the aerodrome, smoking innumerable cigarettes and exchanging alleged funny yarns, whilst awaiting the pleasure of King Zephyr and Queen Nimbus.

While under preliminary instruction he is considered neither use nor ornament, unless the wind will allow a lighted and unprotected match to burn itself out when held in the centre of the flying field, the nearest air pocket, or "bump," having to be not less than fifty miles distant.

Consequent upon the delightful variation of our climatic conditions, and the customs of instructors, he leaves the earth about once per week, and spends the remainder of his evenings in waiting for the weather and official orders to change for the better, cursing roundly the while his fate, misfortune, and birth.

THE FIRST FLIGHT ALONE.

Probably this continues for a month or two, when at last the long hoped for moment arrives, and he is allowed to take into the air, quite alone and without human ballast, some machine which has seen better days and will not be a great loss if crashed.

This flight is dubbed the "first solo," and is a most eventful and exciting crisis in what has up to now been a miserable, monotonous, and worrying existence. Previously, of course, our pilgrim has had complete and exclusive control of a machine in flight, etc., but always with an instructor as a sort of passenger, ballast, mentor, sword of Damocles, and very occasionally Job's comforter, all rolled in one.

Instructors, one might here say, are very extraordinary mortals. Their business is to dispense knowledge to flying pupils, rudely dubbed "quirks." They do this, not with the suspiciously obliging air of a London tradesman delivering a pennyworth of candles at the door, but with the reluctant mien of one who, each time he speaks wisdom, gives away part of his body. Consequently the pupil is usually left very much to his own resources, which may be good or bad, according to opinion and his own intelligence.

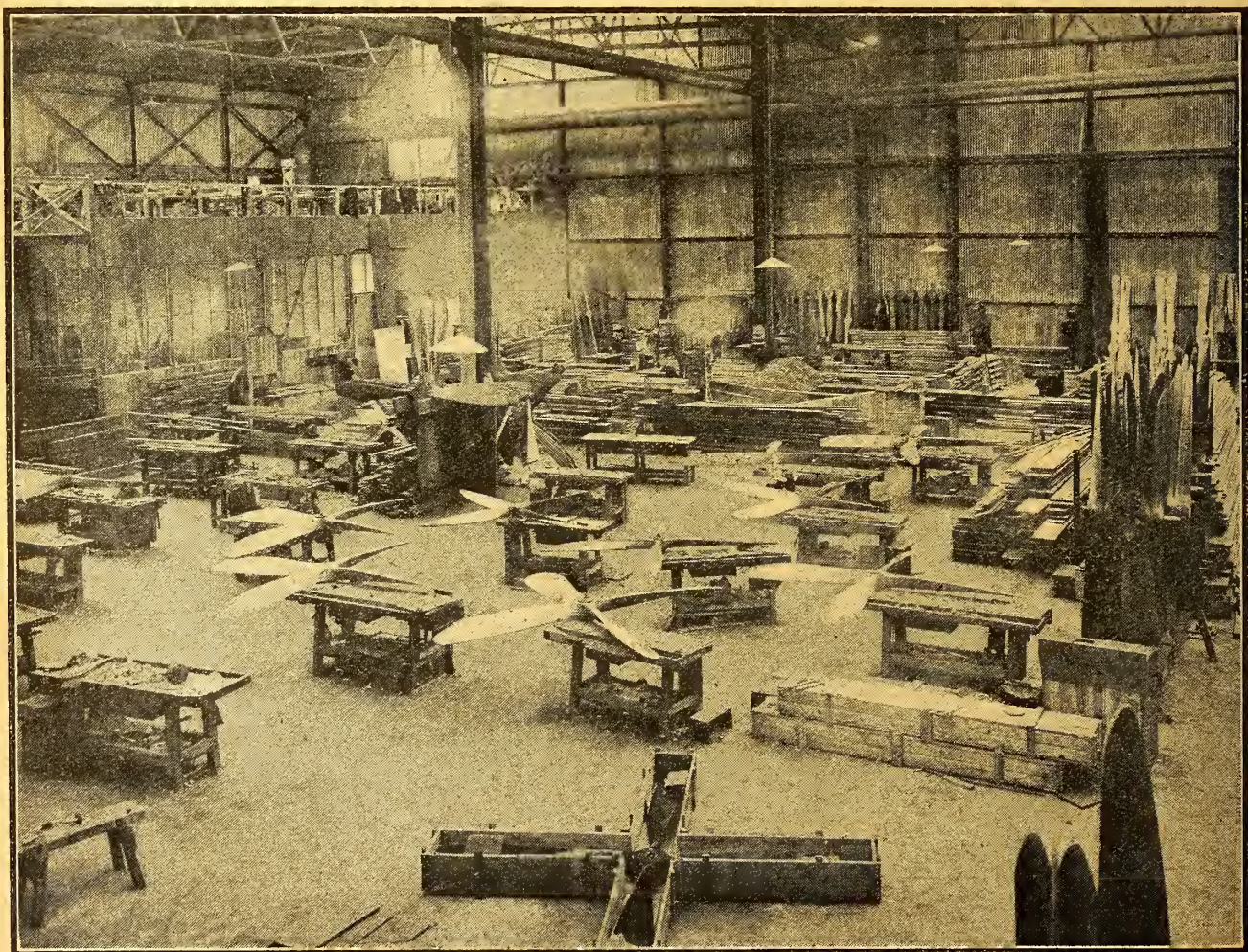
Another trouble is this. At a flying school an instructor is usually one of the Staff, and on this account usually imagines himself one of the High Gods. The pupil, unfortunately, is too often the raw and shy product of a public school, who has known nothing else but the tyrannical rule of schoolmasters, and is too easily persuaded to accept his instructor's own estimate of himself. This, coupled with the fact that many people have never before the War known the meaning of either authority or position, sometimes leads to arrant bullying of one who, in a more lengthily organised service, would be considered a brother officer.

The immediate consequence is that quite often a subdued and timorous "quirk" is afraid to ask questions which would enlighten him, and that, owing solely to the false and exaggerated gulf between them, the pupil and instructor do not pull together or discuss points as would two personal friends, and as is really necessary for the mutual progress of both.

On eventually reaching the solo stage, these hardships are almost forgotten in the joy of the present, for solo flying most assuredly marks a new era in the flying life of an aviator, so much so that it would be very fitting to close here and begin the next stages with a new chapter.

Enough has been said, however, to show that by the time the Prob.-Sub-Loot has reached that stage he is thoroughly inured to the hardships of campaigning, to the manners and customs of any species of senior officer, and to those long periods of waiting on active service for much needed aeroplanes which have somehow been sent somewhere else, or not sent at all.

S. J. K.



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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

GLIDING.

The following extracts are taken from a lecture delivered by the late Mr. Wilbur Wright before the Western Society of Engineers at Chicago, on September 18th, 1901. The Editor of *THE AEROPLANE* is indebted to Mr. Griffith Brewer for the report, which is reprinted from an appendix to his recent lecture before the Aeronautical Society of Great Britain.

The lecture by Mr. Wright was further distinguished by the presence of Octave Chanute, one of the earliest gliding experimenters. Mr. Wright said:—

My own active interest in aeronautical problems dates back to the death of Lilienthal in 1896. The brief notice of his death which appeared in the telegraphic news at that time aroused a passive interest which had existed from my childhood, and led me to take down from the shelves of our home library a book on "Animal Mechanism," by Prof. Marey, which I had already read several times. From this I was led to read more modern works, and as my brother soon became equally interested with myself, we soon passed from the reading to the thinking, and finally to the working stage. It seemed to us that the main reason why the problem had remained so long unsolved was that no one had been able to obtain any adequate practice. We figured that Lilienthal in five years of time had spent only about five hours in actual gliding through the air. The wonder was not that he had done so little, but that he had accomplished so much. It would not be considered at all safe for a bicycle rider to attempt to ride through a crowded city street after only five hours' practice, spread out in bits of ten seconds each over a period of five years; yet Lilienthal with this brief practice was remarkably successful in meeting the fluctuations and eddies of wind gusts.

We thought that if some method could be found by which it would be possible to practise by the hour instead of by the second there would be hope of advancing the solution of a very difficult problem. It seemed feasible to do this by building a machine which would be sustained at a speed of 18 miles per hour, and then finding a locality where winds of this velocity were common. With these conditions a rope attached to the machine to keep it from floating backward would answer very nearly the same purpose as a propeller driven by a motor, and it would be possible to practise by the hour, and without any serious danger, as it would not be necessary to rise far from the ground, and the machine would not have any forward motion at all.

We found, according to the accepted tables of air pressures on curved surfaces, that a machine spreading 200 square feet of wing surface would be sufficient for our purpose, and that places could easily be found along the Atlantic coast where winds of 16 to 25 miles were not at all uncommon. When the winds were low it was our plan to glide from the tops of sand hills, and when they were sufficiently strong to use a rope for our motor and fly over one spot.

Our next work was to draw up the plans for a suitable machine. After much study we finally concluded that tails were a source of trouble rather than of assistance, and therefore we decided to dispense with them altogether. It seemed reasonable that if the body of the operator could be placed in an horizontal position instead of the upright, as in the machines of Lilienthal, Pilcher, and Chanute, the wind resistance could be very materially reduced, since only one square foot instead of five would be exposed. As a full half-horse-power could be saved by this change, we arranged to try at least the horizontal position.

Then the method of control used by Lilienthal, which consisted in shifting the body, did not seem quite as quick or effective as the case required; so, after long study, we contrived a system consisting of two large surfaces on the Chanute double-deck plan, and a smaller surface placed a short distance in front of the main surfaces in such a position that the action of the wind upon it would counterbalance the effect of the travel of the centre of pressure on the main surfaces. Thus changes in the direction and velocity of the wind would have little disturbing effect, and the operator would be required to attend only to the steering of the machine, which was to be effected by curving the forward surface up or down.

The lateral equilibrium and the steering to right or left was to be attained by a peculiar torsion of the main surfaces, which was equivalent to presenting one end of the wings at a greater angle than the other. In the main frame a few changes were also made in the details of construction and trussing employed by Mr. Chanute. The most important of these were: (1) The moving of the forward main cross-piece of the frame to the extreme front edge; (2) the encasing in the cloth of all cross-pieces and ribs of the surfaces; (3) a rearrangement of the wires used in trussing the two surfaces together, which rendered it possible to tighten all the wires by simply shortening two of them.

With these plans we proceeded in the summer of 1900 to Kitty Hawk, North Carolina, a little settlement located on the strip of land that separates Albemarle Sound from the Atlantic Ocean. Owing to the impossibility of obtaining suitable material for a 200-square-foot machine, we were compelled to make it only 165 square feet in area, which, according to the Lilienthal tables,

would be supported at an angle of three degrees in a wind of about 21 miles per hour. On the very day that the machine was completed the wind blew from 25 to 30 miles per hour, and we took it out for trial as a kite. We found that while it was supported with a man on it in a wind of about 25 miles, its angle was much nearer 20 degrees than three degrees. Even in gusts of 30 miles the angle of incidence did not get as low as three degrees, although the wind at this speed has more than twice the lifting power of a 21-mile wind.

As winds of 30 miles per hour are not plentiful on clear days, it was at once evident that our plan of practising by the hour, day after day, would have to be postponed.

Our system of twisting the surfaces to regulate the lateral balance was tried and found to be much more effective than shifting the operator's body. On subsequent days, when the wind was too light to support the machine with a man on it, we tested it as a kite, working the rudders by cords reaching to the ground. The results were very satisfactory, yet we were well aware that this method of testing is never wholly convincing until the results are confirmed by actual gliding experience.

We then turned our attention to making a series of actual measurements of the lift and drift of the machine under various loads. So far as we were aware, this had never previously been done with any full-sized machine. The results obtained were most astonishing, for it appeared that the total horizontal pull of the machine, while sustaining a weight of 52 lbs., was only 8.5 lbs., which was less than had previously been estimated for head resistance of the framing alone. Making allowance for the weight carried, it appeared that the head resistance of the framing was but little more than 50 per cent. of the amount which Mr. Chanute had estimated as the head resistance of the framing of his machine.

On the other hand, it appeared sadly deficient in lifting power as compared with the calculated lift of curved surfaces of its size. This deficiency we supposed might be due to one or more of the following causes:—(1) That the depth of the curvature of our surfaces was insufficient, being only about one in 22, instead of one in 12. (2) That the cloth used in our wings was not sufficiently air-tight. (3) That the Lilienthal tables might themselves be somewhat in error. We decided to arrange our machine for the following years so that the depth of curvature of its surfaces could be varied at will and its covering air-proofed.

Our attention was next turned to gliding, but no hill suitable for the purpose could be found near our camp at Kitty Hawk. This compelled us to take the machine to a point four miles south, where the Kill Devil sand hill rises from the flat sand to a height of more than 100 feet. Its main slope is toward the north-east, and has an inclination of 10 degrees.

On the day of our arrival the wind blew about 25 miles an hour, and as we had had no experience at all in gliding, we deemed it unsafe to attempt to leave the ground. But on the day following, the wind having subsided to 14 miles per hour, we made about a dozen glides.

It had been the original intention that the operator should run with the machine to obtain initial velocity, and assume the horizontal position only after the machine was in free flight. When it came time to land he was to resume the upright position and alight on his feet, after the style of previous gliding experimenters. But on actual trial we found it much better to employ the help of two assistants in starting, which the peculiar form of our machine enabled us readily to do; and in landing we found that it was entirely practicable to land while still reclining in an horizontal position upon the machine.

Although the landings were made while moving at speeds of more than 20 miles an hour, neither machine nor operator suffered any injury. The slope of the hill was 9.5 deg., or a drop of one foot in six. We found that after attaining a speed of about 25 to 30 miles with reference to the wind, or 10 to 15 miles over the ground, the machine not only glided parallel to the slope of the hill, but greatly increased its speed, thus indicating its ability to glide on a somewhat less angle than 9.5 deg., when we should feel it safe to rise higher from the surface.

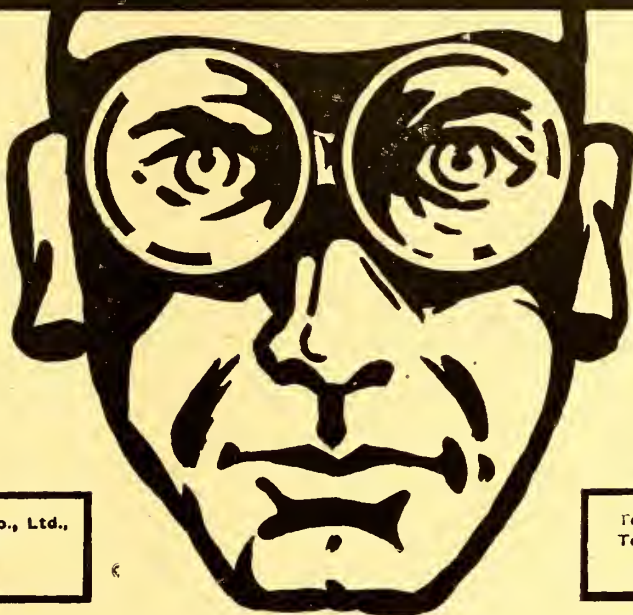
The control of the machine proved even better than we had dared to expect, responding quickly to the slightest motion of the rudder. With these glides our experiments for the year 1900 closed. Although the hours and hours of practice we had hoped to obtain finally dwindled down to about two minutes, we were very much pleased with the general results of the trip, for, setting out as we did with almost revolutionary theories on many points and an entirely untried form of machine, we considered it quite a point to be able to return without having our pet theories knocked on the head by the hard logic of experience, and our own brains dashed out in the bargain.

Everything seemed to us to confirm the correctness of our original opinions—(1) that practice is the key to the secret of flying; (2) that it is practicable to assume the horizontal position; (3) that a smaller surface set at a negative angle in front of the main bearing surfaces, or wings, will largely counteract the effect

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Mr. Alec Ogilvie making a record soaring glide of ten minutes' duration at Kitty Hawk, North Carolina, U.S.A.

of the fore and aft travel of the centre of pressure; (4) that steering up and down can be attained with a rudder without moving the position of the operator's body; (5) that twisting the wings so as to present their ends to the wind at different angles is a more prompt and efficient way of maintaining lateral equilibrium than shifting the body of the operator.

When the time came to design our new machine for 1901 we decided to make it exactly like the previous machine in theory and method of operation. But as the former machine was not able to support the weight of the operator when flown as a kite, except in very high winds and at very large angles of incidence, we decided to increase its lifting power.

Accordingly, the curvature of the surfaces was increased to one in 12, to conform to the shape on which Lilienthal's table was based, and to be on the safe side we decided also to increase the area of the machine from 165 square feet to 308 square feet, although so large a machine had never before been deemed controllable. The Lilienthal machine had an area of 151 square feet; that of Pilcher, 165 square feet; and the Chanute double-decker, 134 square feet. As our system of control consisted in a manipulation of the surfaces themselves instead of shifting the operator's body, we hoped that the new machine would be controllable, notwithstanding its great size. According to calculations, it would obtain support in a wind of 17 miles per hour with an angle of incidence of only three degrees.

Our experience of the previous year having shown the necessity of a suitable building for housing the machine, we erected a cheap frame building, 16 feet wide, 25 feet long, and 7 feet high at the eaves. As our machine was 22 feet wide, 14 feet long (including the rudder), and about 6 feet high, it was not necessary to take the machine apart in any way in order to house it. Both ends of the building, except the gable parts, were made into doors which hinged above, so that when opened they formed an awning at each end and left an entrance the full width of the building.

We went into camp about the middle of July, and were soon joined by Mr. E. C. Huffaker, of Tennessee, an experienced aeronautical investigator in the employ of Mr. Chanute, by whom his services were kindly loaned, and by Dr. G. A. Spratt, of Pennsylvania, a young man who has made some valuable investigations of the properties of variously curved surfaces and the travel of the centre of pressure thereon. Early in August Mr. Chanute came down from Chicago to witness our experiments, and spent a week in camp with us. These gentlemen, with my brother and myself, formed our camping party, but in addition we had in many of our experiments the valuable assistance of Mr. W. J. Tate and Mr. Dan Tate, of Kitty Hawk.

The machine was completed and tried for the first time on July 27th in a wind blowing about 13 miles an hour. The operator having taken a position where the centre of pressure was supposed to be, an attempt at gliding was made; but the machine turned downward and landed after going only a few yards. This indicated that the centre of gravity was too far in front of the centre of pressure. In the second attempt the operator took a position several inches farther back, but the result was much the same. He kept moving farther and farther back with each trial, till finally he occupied a position nearly a foot

back of that at which we had expected to find the centre of pressure. The machine then sailed off and made an undulating flight of a little more than 300 feet.

To the onlookers this flight seemed very successful, but to the operator it was known that the full power of the rudder had been required to keep the machine from either running into the ground or rising so high as to lose all headway. In the 1900 machine one-fourth as much rudder action had been sufficient to give much better control. It was apparent that something was radically wrong, though we were for some time unable to locate the trouble. In one glide the machine rose higher and higher till it lost all headway. This was the position from which Lilienthal had always found difficulty to extricate himself, as his machine then, in spite of his greatest exertions, manifested a tendency to dive downward almost vertically and strike the ground head on with frightful velocity.

In this case a warning cry from the ground caused the operator to turn the rudder to its full extent and also to move his body slightly forward. The machine then settled slowly to the ground, maintaining its horizontal position almost perfectly, and landed without any injury at all. This was very encouraging, as it showed that one of the very greatest dangers in machines with horizontal tails had been overcome by the use of a front rudder.

Several glides later the same experience was repeated with the same result. In the latter case the machine had even commenced to move backward, but was nevertheless brought safely to the ground in an horizontal position. On the whole, this day's experiments were encouraging, for while the action of the rudder did not seem at all like that of our 1900 machine, yet we had escaped without difficulty from positions which had proved very dangerous to preceding experimenters, and after less than one minute's actual practice had made a glide of more than 300 feet, at an angle of descent of 10 degrees, and with a machine nearly twice as large as had previously been considered safe.

The trouble with its control, which has been mentioned, we believed could be corrected when we should have located its cause. Several possible explanations occurred to us, but we finally concluded that the trouble was due to a reversal of the direction of the travel of the centre of pressure at small angles. In deeply curved surfaces the centre of pressure at 90 degrees is near the centre of the surface, but moves forward as the angle becomes less, till a certain point is reached, varying with the depth of curvature. After this point is passed the centre of pressure, instead of continuing to move forward, with the decreasing angle, turns and moves rapidly toward the rear.

The phenomena are due to the fact that at small angles the wind strikes the forward part of the surface on the upper side instead of the lower, and thus this part altogether ceases to lift, instead of being the most effective part of all, as is the case of the plane. Lilienthal had called attention to the danger of using surfaces with a curvature as great as one in eight, on account of this action on the upper side; but he seems never to have investigated the curvature and angle at which the phenomena entirely cease. My brother and I had never made any original investigation of the matter, but assumed that a curvature of one in 12 would be safe, as this was the curvature on which Lilienthal based his tables. However, to be on the safe side,

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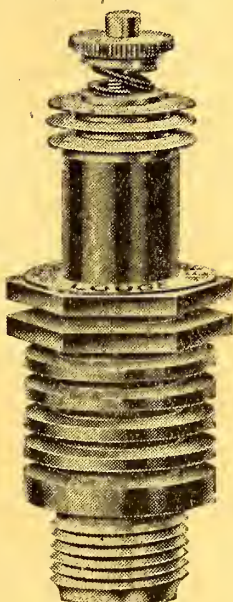
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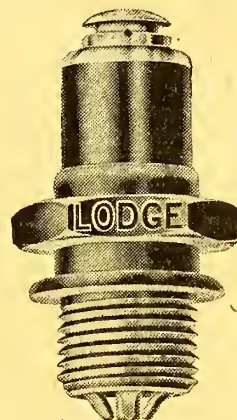
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instead of using the arc of a circle, we had made the curve of our machine very abrupt at the front, so as to expose the least possible area to this downward pressure.

While the machine was building Messrs. Huffaker and Spratt had suggested that we would find this reversal of the centre of pressure, but we believed it sufficiently guarded against. Accordingly, we were not at first disposed to believe that this reversal actually existed in our machine, although it offered a perfect explanation of the action we had noticed in gliding. Our peculiar plan of control by forward surfaces, instead of tails, was based on the assumption that the centre of pressure would continue to move farther and farther forward, as the angle of incidence became less, and it will be readily perceived that it would make quite a difference if the front surface, instead of counteracting this assumed forward travel, should in reality be expediting an actual backward movement.

For several days we were in a state of indecision, but were finally convinced by observing the following phenomena:—We had removed the upper surface from the machine and were flying it in a wind to see at what angles it would be supported in winds of different strengths. We noticed that in light winds it flew with a strong upward pull on the cord. As the wind became stronger the angle of incidence became less, and the surface flew with a slight horizontal pull. But when the wind became still stronger it took a position with a strong downward pull.

It at once occurred to me that here was the answer to our problem, for it is evident that in the first case the centre of pressure was in front of the centre of gravity and thus pushed up the front edge; in the second case they were in coincidence, and the surface in equilibrium; while in the third case the centre of pressure had reached a point even behind the centre of gravity, and there was therefore a downward pull on the cord. This point having been definitely settled, we proceeded to truss down the ribs of the whole machine, so as to reduce the depth of curvature.

On resuming our gliding we found that the old conditions of the preceding year had returned, and, after a few trials, made a glide of 366 feet and soon after one of 389 feet. The machine, with its new curvature, never failed to respond promptly to even small movements of the rudder. The operator could cause it to almost skim the ground, following the undulations of its surface, or he could cause it to sail out almost on a level with the starting point, and, passing high above the foot of the hill, gradually settle down to the ground. The wind on this day was blowing 11 to 14 miles per hour.

The next day, the conditions being favourable, the machine was again taken out for trial. This time the velocity of the wind was 18 to 22 miles per hour. At first we felt some doubt as to the safety of attempting free flight in so strong a wind, with a machine of over 300 square feet and a practice of less than five minutes spent in actual flight. But after several preliminary experiments we decided to try a glide. The control of the machine seemed so good that we then felt no apprehension in sailing boldly forth. And thereafter we made glide after glide, sometimes following the ground closely and sometimes sailing high in the air. Mr. Chanute had his camera with him, and took pictures of some of these glides.

We made glides on subsequent days, whenever the conditions were favourable. The highest wind thus experimented in was a little over 12 metres per second—nearly 27 miles per hour.

It had been our intention when building the machine, to do the larger part of the experimenting in the following manner:—When the wind blew 17 miles an hour, or more, we would attach a rope to the machine and let it rise as a kite with the operator upon it. When it should reach a proper height the operator would cast off the rope and glide down to the ground just as from the top of a hill. In this way we would be saved the trouble of carrying the machine uphill after each glide, and could make at least 10 glides in the time required for one in the other way.

But when we came to try it we found that a wind of 17 miles, as measured by Richard's anemometer, instead of sustaining the machine with its operator, a total weight of 240 lbs., at an angle of incidence of three degrees, in reality would not sustain the machine alone—100 lbs.—at this angle. Its lifting capacity seemed scarcely one-third of the calculated amount. In order to make sure that this was not due to the porosity of the cloth, we constructed two small experimental surfaces of equal size, one of which was air-proofed and the other left in its natural state; but we could detect no difference in their lifting powers.

For a time we were led to suspect that the lift of curved surfaces little exceeded that of planes of the same size, but further investigation and experiment led to the opinion that (1) the anemometer used by us over-recorded the true velocity of the wind by nearly 15 per cent.; (2) that the well-known Smeaton coefficient of $.0005 V^2$ for the wind pressure at 90 degrees is probably too great by at least 20 per cent.; (3) that Lilienthal's estimate that the pressure on a curved surface having an angle of incidence of three degrees equals .545 of the pressure at 90 degrees is too large, being nearly 50 per cent. greater than very recent experiments of our own with a special pressure-testing machine indicate; (4) that the superposition of the surfaces somewhat reduced the lift per sq. ft. as compared with a single surface of equal area.

In gliding experiments, however, the amount of lift is of less relative importance than the ratio of lift to drift, as this alone decides the angle of gliding descent. In a plane the pressure is always perpendicular to the surface, and the ratio of lift to drift is therefore the same as that of the cosine to the sine of the angle of incidence. But in curved surfaces a very remarkable situation is found. The pressure, instead of being uniformly normal to the chord of the arc, is usually inclined considerably in front of the perpendicular. The result is that the lift is greater and the drift less than if the pressure were normal.

Lilienthal was the first to discover this exceedingly important fact, which is fully set forth in his book, "Bird Flight the Basis of the Flying Art," but owing to some errors in the methods he used in making measurements, question was raised by other investigators not only as to the accuracy of his figures, but even as to the existence of any tangential force at all. Our experiments confirm the existence of this force, though our measurements differ considerably from those of Lilienthal.

While at Kitty Hawk we spent much time in measuring the horizontal pressure on our unloaded machine at various angles of incidence. We found that at 13 degrees the horizontal pressure was about 23 lbs. This included not only the drift proper, or horizontal component of the pressure on the side of the surface, but also the head resistance of the framing as well. The weight of the machine at the time of this test was about 108 lbs.

Now, if the pressure had been normal to the chord of the surface, the drift proper would have been to the lift (108 lbs.) as the sine of 13 degrees is to the cosine of 13 degrees, or $\frac{.22 \times 108}{.97}$ = 24 lbs.; but this slightly exceeds the total pull of 23 lbs. on our scales.

Therefore it is evident that the average pressure on the surface, instead of being normal to the chord, was so far inclined toward the front that all the head resistance of framing and wires used in the construction was more than overcome. In a wind of 14 miles per hour resistance is by no means a negligible factor, so that tangential is evidently a force of considerable value. In a higher wind, which sustained the machine at an angle of 10 degrees, the pull on the scales was 18 lbs. With the pressure normal to the chord the drift proper would have been $\frac{.17 \times 98}{.98}$ = 17 lbs., so that, although the higher wind velocity must have caused an increase in the head resistance, the tangential force still came within one pound of overcoming it.

After our return from Kitty Hawk we began a series of experiments to accurately determine the amount and direction of the pressure produced on curved surfaces when acted upon by winds at the various angles from zero to 90 degrees. These experiments are not yet concluded, but in general they support Lilienthal in the claim that the curves give pressures more favourable in amount and direction than planes; but we find marked differences in the exact values, especially at angles below 10 degrees.

We were unable to obtain direct measurements of the horizontal pressures of the machine with the operator on board, but by comparing the distance travelled in gliding with the vertical fall, it was easily calculated that at a speed of 24 miles per hour the total horizontal resistances of our machine, when bearing the operator, amounted to 40 lbs., which is equivalent to about 2½ horse-power.

It must not be supposed, however, that a motor developing this power would be sufficient to drive a man-bearing machine. The extra weight of the motor would require either a larger machine, higher speed, or a greater angle of incidence in order to support it, and therefore more power. It is probable, however, that an engine of six horse-power, weighing 100 lbs., would answer the purpose.

Such an engine is entirely practicable. Indeed, working motors of one-half this weight per horse-power (9 lbs. per horse-power) have been constructed by several different builders. Increasing the speed of our machine from 24 to 33 miles per hour reduced the total horizontal pressure from 40 to about 35 lbs. This was quite an advantage in gliding, as it made it possible to sail about 15 per cent. farther with a given drop. However, it would be of little or no advantage in reducing the size of the motor in a power-driven machine, because the lessened thrust would be counterbalanced by the increased speed per minute.

Some years ago Prof. Langley called attention to the great economy of thrust which might be obtained by using very high speeds, and from this many were led to suppose that high speed was essential to success in a motor-driven machine. But the economy to which Prof. Langley called attention was in foot pounds per mile of travel, not in foot pounds per minute. It is the foot pounds per minute that fixes the size of the motor.

The probability is that the first flying machines will have a relatively low speed, perhaps not much exceeding 20 miles per hour, but the problem of increasing the speed will be much simpler

* The travel of the centre of pressure made it necessary to put sand on the front rudder to bring the centres of gravity and pressure into coincidence, consequently the weight of the machine varied from 98 lbs. to 108 lbs. in the different tests.

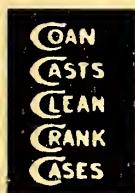
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in some respects than that of increasing the speed of a steamboat; for, whereas in the latter case the size of the engine must increase as the cube of the speed, in the flying machine, until extremely high speeds are reached, the capacity of the motor increases in less than simple ratio; and there is even a decrease in the fuel consumption per mile of travel. In other words, to double the speed of a steamship (and the same is true of the balloon type of airship) eight times the engine and boiler capacity would be required, and four times the fuel consumption per mile of travel; while a flying machine would require engines of less than double the size, and there would be an actual decrease in the fuel consumption per mile of travel.

But, looking at the matter conversely, the great disadvantage of the flying machine is apparent; for in the latter no flight at all is possible unless the proportion of horse-power to flying capacity is very high; but, on the other hand, a steamship is a mechanical success if its ratio of horse-power to tonnage is insignificant. A flying machine that would fly at a speed of 50 miles an hour with engines of 1,000 horse-power would not be upheld by its wings at all at a speed of less than 25 miles an hour, and nothing less than 500 horse-power could drive it at this speed. But a boat which could make 40 miles per hour with engines of 1,000 horse-power would still move four miles an hour even if the engines were reduced to one horse-power. The problems of land and water travel were solved in the nineteenth century, because it was possible to begin with small achievements and gradually work up to our present success. The flying problem was left over to the twentieth century, because in this case the art must be highly developed before any flight of any considerable duration at all can be obtained.

However, there is another way of flying which requires no artificial motor, and many workers believe that success will first come by this road. I refer to the soaring flight, by which the machine is permanently sustained in the air by the same means that are employed by soaring birds. They spread their wings to the wind, and sail by the hour, with no perceptible exertion beyond that required to balance and steer themselves. What sustains them is not definitely known, though it is almost certain that it is a rising current of air. But whether it be a rising current or something else, it is as well able to support a flying machine as a bird, if man once learns the art of utilising it.

In gliding experiments it has long been known that the rate of vertical descent is very much retarded, and the duration of the flight greatly prolonged, if a strong wind blows up the face of the hill parallel to its surface. Our machine, when gliding in still air, has a rate of vertical descent of nearly six feet per second, while in a wind blowing 26 miles per hour up a steep hill we made glides in which the rate of descent was less than two

feet per second. And during the larger part of this time, while the machine remained exactly in the rising current, *there was no descent at all, but even a slight rise*. If the operator had had sufficient skill to keep himself from passing beyond the rising current he would have been sustained indefinitely at a higher point than that from which he started.

These slow glides in rising currents probably hold out greater hope of extensive practice than any other method within man's reach, but they have the disadvantage of requiring rather strong winds or very large supporting surfaces. However, when gliding operators have attained greater skill they can, with comparative safety, maintain themselves in the air for hours at a time in this way, and thus by constant practice so increase their knowledge and skill that they can rise into the higher air and search out the currents which enable the soaring birds to transport themselves to any desired point by first rising in a circle and then sailing off at a descending angle.

In looking over our experiments of the past two years, with models and full-size machines, the following points stand out with clearness:—

1. That the lifting power of a large machine, held stationary in a wind at a small distance from the earth, is much less than the Lilienthal table and our own laboratory experiments would lead us to expect. When the machine is moved through the air, as in gliding, the discrepancy seems much less marked.

2. That the ratio of drift to lift in well-shaped surfaces is less at angles of incidence of 5 degrees to 12 degrees than at an angle of 3 degrees.

3. That in arched surfaces the centre of pressure at 90 degrees is near the centre of the surface, but moves slowly forward as the angle becomes less, till a critical angle varying with the shape and depth of the curve is reached, after which it moves rapidly toward the rear till the angle of no lift is found.

4. That with similar conditions large surfaces may be controlled with not much greater difficulty than small ones if the control is effected by manipulation of the surfaces themselves, rather than by a movement of the body of the operator.

5. That the head resistances of the framing can be brought to a point much below that usually estimated as necessary.

6. That tails, both vertical and horizontal, may with safety be eliminated in gliding and other flying experiments.

7. That an horizontal position of the operator's body may be assumed without excessive danger, and thus the head resistance reduced to about one-fifth that of the upright position.

8. That a pair of superposed, or tandem, surfaces has less lift in proportion to drift than either surface separately, even after making allowance for weight and head resistance of the connections.

Aircraft for Sea Service.

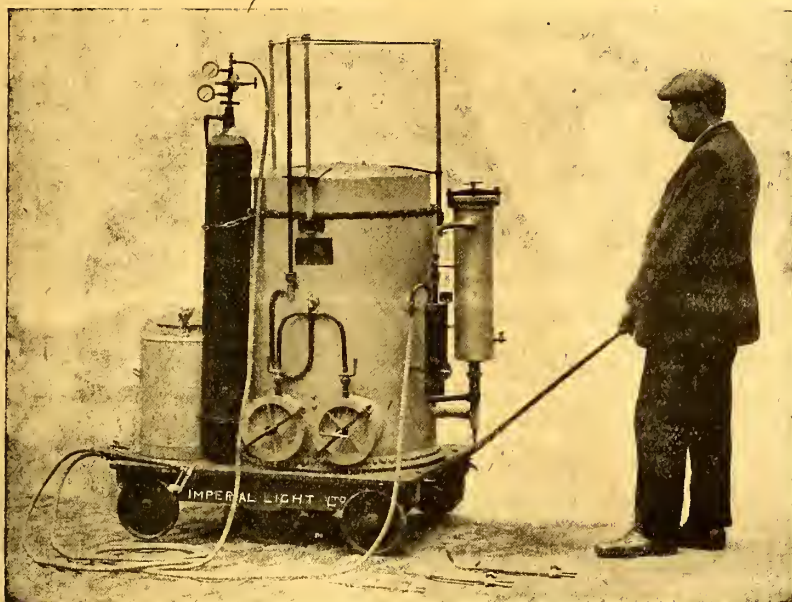
ADMIRAL BACON'S VIEWS IN 1912.

It is always interesting to compare modern experience with earlier theories. So long ago as April 17th, 1912, a paper on Aircraft for Sea Service was read at the United Service Institute by Lieut. (now Commander) Boothby, R.N. This paper was published in *THE AEROPLANE* on December 29th of last year. The chairman at that meeting was Rear-Admiral Bacon, then directing the fortunes of the Coventry Ordnance Works, and now Vice-Admiral Sir Reginald Hugh Spencer Bacon, K.C.B., K.C.V.O., and Admiral Commanding Patrols at Dover, which command includes our aircraft at Dunkerque. After the paper had been read, Admiral Bacon made the following remarks:—

A fascinating view was put forward as regards the number of aeroplanes that could be carried on board a ship. It was said that the aeroplanes could be sent out in numbers and then brought back again, on board the war vessel. I have no reason to say that that is not possible; but I would remind you of the analogy of the second-class torpedo-boat. One of the most fascinating theories in my younger days in the Navy was that of the second-class torpedo-boat, which was to be carried on board ship—one ship had eight of them. The idea was that when the ship got near the enemy, who might be in harbour, the torpedo-boats were hoisted out; away they went after the enemy's fleet, sank them, and then they came back again. The thing was apparently the simplest thing in the world. As a matter of fact, battleships were fitted to carry these boats, but within three years of the time

when they were put on board battleships every single one of them was removed. The theory was perfect, but the practice was impossible. The delays caused by getting the boats in, the small breakdowns on the boats when they were away, made the whole scheme useless. In dealing with any of these questions we must be extremely careful not to express too definite opinions upon what may or may not be possible in the future. A thing may be possible or not possible; when it comes to be tried practically, the thing that appears to be very simple often becomes very difficult, and equally often that which appears most difficult turns out to be really a simple matter.

Although in no way wishing to detract from the value of aeroplanes to the Navy, under certain conditions, anyone who seriously studies the strategical requirements of the British Isles, due to their peculiar geographical situation in Europe, must inevitably arrive at the same conclusion as the lecturer: that if the airship can be properly developed it is of considerably more use than the aeroplane as we know it now. I am quite certain that anybody who really studies the subject must come to that conclusion for very good reasons. It takes a good deal of looking into, but I think we may accept it as a fact. Prolonged endurance is necessary for prolonged reconnaissance; the aircraft must possess the power of navigating accurately. The scout may be away for a considerable time at a considerable distance, in varying weathers, such as fogs, and he must keep his reckoning practically as accurately as is done on a ship, and that is one reason why there must be one, two, three, or four people in the same air vessel.



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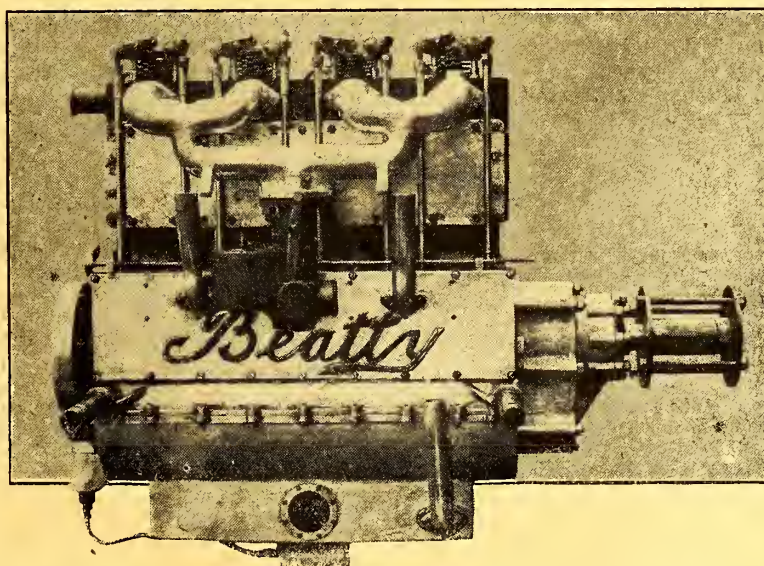
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THE NEED FOR EXPERIMENTS.

The difficulty in the development of the airship lies in the fact that its commercial use is restricted, and the cost of experimenting with it is very high. So great is the cost that systematic experiments can only be carried out by philanthropists or by Governments. There is perhaps no class of work in which experimenting must be started so absolutely from the very commencement of design, since every portion of the hull material and fabric has to be invented and developed. Moreover, these special materials find little use in other commercial undertakings so that assistance from collateral sources of demand for similar material is non-existent. Unless we are to be out-distanced in the future by other countries in airship development, systematic and probably expensive experimenting will have to be undertaken in England, and the only people who can undertake it are the Government, and preferably the Admiralty.

The urgency of the matter cannot be over-emphasised, since the development is not merely a matter of design, of shape, detail, etc., as was the case in submarine boats, but it entails the gaining of experience of materials and fabrics, all of which have to be experimented with. And since the composition and treatment of similar materials is certain to be kept secret by whatever country develops the airship, we may well wake up one morning and find that we are absolutely unable to produce what other countries perhaps have produced, because we have not got an elementary notion or knowledge of the materials that we have to use, and therefore we may be without the slightest reply to what, if it is developed, will be a very formidable class of scout. [It may be noted that we are now paying, in every Zeppelin raid, for our neglect of experiments in the directions indicated by Admiral Bacon.—Ed.]

It was considerations such as these which led the late Board of Admiralty to build an airship at Barrow. That airship was built entirely as an experimental platform. No one who knew the necessarily tentative nature of the work dreamed that the vessel would be more than a vast experiment on which to build future experience. No responsible person anticipated that the vessel would even leave her mooring post for at least six months after she was launched from her shed, during which time she could carry out her speed trials, which were very simple because it was only necessary to steam her to test her pace in varying strengths of wind, so that the whole of the speed

factors and other information could be obtained in the same way as if she had not been attached to the mooring post. Experience would be afforded of weather conditions, mooring, leakage of gas, variation in weight due to varying hygrometer conditions, effects of aerial electricity, effects of variation of temperature, and deterioration of structure, which observations could only be carried out on a life-size model. These and numberless other experiments could have been carried out perfectly well at her post without her ever making a sensational trip. Unfortunately the vessel met with an accident at the commencement of her career, and has since not been publicly heard of. But that in consequence of this accident further experimenting in the direction of rigid dirigibles should be discontinued is inconceivable. A failure to achieve should only stimulate further exertion, and we may confidently look forward to increased activity on the part of the Admiralty, for if they allow the original experiments to drop it will be the first time on record that the Navy has run away from attempting to achieve because the attempt was difficult and courage was required to face temporary failure. [Unfortunately, owing to Treasury parsimony the Navy was compelled to run away from its responsibilities.—Ed.]

IMPORTANCE OF A FORWARD POLICY.

We must always be careful about *ex cathedra* opinions. I remember very well a very distinguished foreign admiral who stated that submarine boats were useless, and that they would never have them in his own particular navy. In less than three years that navy was supplied with submarine boats. That statement of his created a lot of harm; it produced a tremendous lot of opposition amongst influential people in England against submarine boats. It was always quoted, "So-and-so says they are useless, and they must be useless." That is one of the dangers we have to face when we are dealing with a problem of the future, that the man of the present is apt to damp the whole of the ardour, official or otherwise, by making too definite statements and failing to appreciate what after all may really be very great possibilities. If England is to make up her position in respect to airship construction, and not to be found deficient in the day of need, we require a forward policy of spending money, perhaps considerable sums, and a courageous sympathy among those in authority which will enable them to wait patiently until systematic and slow laborious experiment wins past un-informed criticism, and at last attains the success which cannot be withheld from unstinted and whole-hearted endeavour. [It is hoped that the foregoing may not only be informative to those who have not hitherto regarded airships seriously, but that it may be a useful lesson.—Ed.]

A CURIOUS ACCIDENT.

On November 9th an aviator came down in the main street of Felling-on-Tyne, the machine being wrecked through striking a lamppost and bursting into flames.

Fatal injuries were inflicted upon an elderly cooper named Robert Allen Brewis, and at the inquest at Gateshead yesterday the jury exonerated the pilot, who expressed his regret.

[At the same time, both Naval and Military pilots are a great deal too fond of flying over towns when there is no need to do so. Engines are still far from being so reliable as to justify making a habit of this trick.—Ed.]

THE USE OF AIRSHIPS.

The story of a German ship which was scuttled and blown up when the crew found escape impossible, was told in the Prize Court on Nov. 13th, when bounty was claimed for the destruction of the "Meteor" on Aug. 9th, 1915.

Commander Anderson, counsel for the British claimants, read an affidavit by Commander R. Y. Tyrwhitt, C.B., D.S.O., who was commanding a squadron of British light cruisers which found the German mine-layer "Meteor" when searching the sea about fifty miles north-west of Horns Reef.

From a neutral vessel the "Arethusa" rescued the crew of the British vessel "Ramsey," and then learned that the "Meteor" had sunk the "Ramsey" and was on her way back to Germany when she was informed by airships of the approach of the British

squadron. The latter had been kept under observation by enemy airships, and on account of the disposal of His Majesty's ships it was impossible for the "Meteor" to escape. She was therefore scuttled and blown up by her crew.

Sir Samuel Evans awarded £655 prize bounty.

A WATCHMAN'S NOTES.

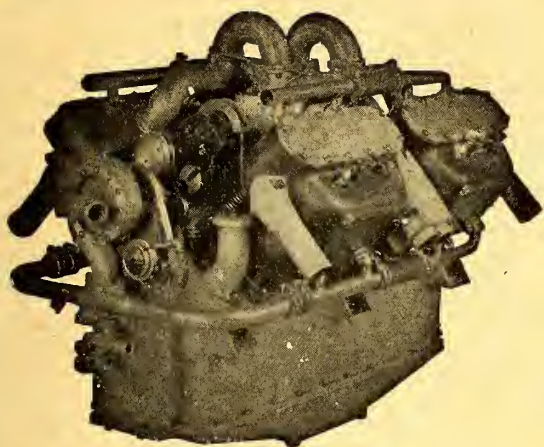
Are night-birds black of wing? I fancy rather that they of jet-black plumage are mostly day-birds. If they sallied forth of nights one imagines friars' rooks and blackbird looking obtrusively black, but the owl is a useful bird.

* * *

The feminine pilot of souls having come rather forward lately, and indeed she almost got into the enemy's trenches, or perhaps one might say his benches, thoughts of her sisters, pilots of mere vile bodies, seems apposite. Why stayed these latter so few in number?

Surely the women of the world *très comme il faut* at the heads of our lists of lady pilots might have expected a larger following. One remembers several charming "aviatrices" with heads of real worth on their shoulders—and *voilà tout*! Now don't say the war killed it, because it did not, the thing languished before then.

Quite seriously one wonders why some of the feminine leaders in hard and good work did not take up observing the world from the detached standpoint of a pew in a plane, though the thing has to be done *sitting, more iberico*.—T. S. H.



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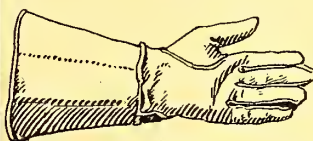
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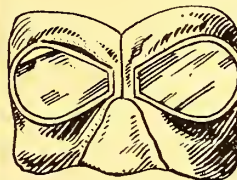
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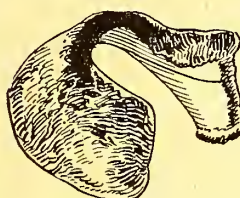
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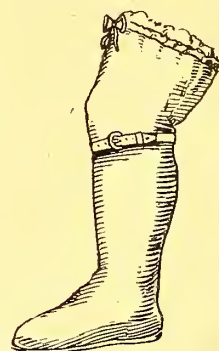
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Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

CONSEQUENCES AND CONDITIONS.

Motor-designing is like nothing so much as a protracted game of consequences; mostly continued in an indefinite next. Beginning in the usual way of the he-idea meeting the she-condition their mutual argument and final agreement make up the rest of the story, up to the commercial issue of what the world said or is going to say.

But the substance of the story is that agreement; in which positively nothing can occur without its direct or indirect consequence. Here in the case of this Duesenberg valve arrangement, whether we mount them in a detachable *culasse* for convenience of grinding and truing up—a much easier thing than usual in the matter of water-jointing, in this case—or fit them in skeleton box-seatings, which is easier still, we have the immediate consequence that the exhausts must point upwards to begin with.

Now is this an advantage or not? Recanting nothing I have said in the case of other motors of different design and valve arrangement, I contend that in this instance it is a very great advantage, initially; no matter how we may eventually dispose of the exhaust-gases. To support this contention, the illustration alone should be enough. For as will be seen, short of the outlet being actually vertical from the combustion chamber, the flow could not be more direct outwards: so that the scavenge—here we see another advantage of gas-engine practice with the piston rising to the very cylinder crown—cannot well be more thorough.

On the other hand, the induction presents the same advantage for direct inward flow, with a fall at that. So that in the matter of special efficiency invited and obtained by mechanical means and general lay-out, the Duesenberg design so far is almost in a class by itself.

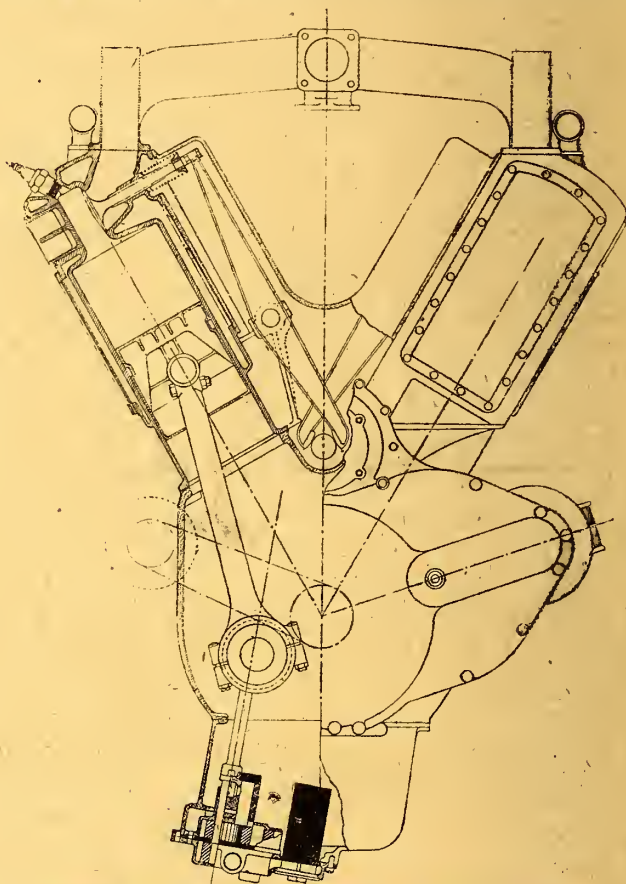
ALTERNATIVES AND EXCHANGES.

Beyond this point, however, it becomes a question of how we can most advantageously relate the consequent exhaust and induction scheme. Keeping the induction lay-out as it is—apparently multi-branched from a centrally-hung carburettor—we again have the mixture-flow direct enough, but we obviously preclude the exhaust being disposed of in any other ways than into two overhead collectors or silencers—which would need to be streamlined, and look clumsy and bulky—or by a stack of six vertical pipes on each side. For we can neither run manifolds inwardly of the V under the induction-branching; nor outwardly, encumbering the head and bending the gas stream around nearly three quarters of a circle.

Here then come in the consequences from an aeromotor, not a laboratory or testing-shop standpoint. That centrally fed induction, very nice in the latter case, is none too well safeguarded for war-flying. That is why, to better the design for this practical reason, I would point out that the whole previous scheme of it equally well permits the fitting of a "shore-haul" or hoop-manifold, running immediately over the upper water circulation tubing. Or even converging upon its present position; for there is also no reason why the axis of that tubing should not be shifted over in line or parallel to the cylinder axis, where it would be no more in the way of the spark-plug insertions than it is now.

Then the induction—which might have a single carburettor, or one at each end of the shorehaul hoop—would be just as direct as ever: but we could reverse the present slight curve of the exhaust stream inwardly of the V or even increase it to meet a single collector-silencer box mounted in the position occupied in

the illustration by the carburettor; or even sunk lower into the V. From this, the exhaust gases could be disposed of by a single tail-tube, upwards or downwards as convenience of installation might require.



Sectional end view of the Duesenberg 300 H.P. Motor.

Clearly, this exchange of positions would encumber the motor, not more, but very much less than the present lay-out, while every physical advantage the latter presents would still be retained. So as a counsel of aeromotor perfecting, it seems worth considering.

VALVE DETAILS.

As to further purely mechanical features, there is also much to interest, in the Duesenberg 300-h.p. model, beyond the dry recount of specification detail. Each of the valves has two concentric springs, probably to exert a more constant degree of elasticity than for any other reason; seeing that the narrowness of the combustion chamber would make it almost impossible for a broken valve-head to fall into the cylinder. The method of spring attachment, too, is effective as well as uncommon, con-

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sisting of a split collar fitting loosely on the valve-stem, but inserted into a transverse groove on it; into which groove it is locked by the upward pressure of a wider button-like collar which acts as the upper seating of the spring. The operating valve-rockers too—which appropriately are of the lightest practicable section—have adjustable contact pieces for the valve-stems, and hardened wipers instead of rollers on their lower ends, where they cross and enclose the cam-shaft, scissors-fashion.

SPRING-COOLING: A MISSED ADVANTAGE.

As we see, the V-shaped aluminium cover houses the lot. Which, on the score of neatness, and some oil-retaining effect, has its advantage. But as it is, this covering nullifies the special advantage which this valve-mounting affords to a peculiar degree, namely the ready cooling of the well-projected springs; a consideration of prime aeromotor importance. The chance to secure this physical effect as well, seems to have been thrown away by not panelling the upper front corners of this cover with gauze and appropriately shaped air funnels or troughs; which in combination with free perforations all along the top of the cover should assure effective radiation.

Otherwise the cover enables the bottom of the V—that is, the hollow top of the crank-chamber—to serve—as it otherwise could not—for an oil bath for the cam-shaft, kept filled from oil forced from the bearings; so that the cams are always kept thoroughly lubricated.

The pistons, which are made of an aluminium alloy called magnalite, are evidently well designed to support combustion-stresses on their heads, and on the gudgeon-pin lugs, as well as for radiation; and the single large ring being formed in three sections, is no doubt adequate for its work. The special gudgeon-pin attachment—pinning by a single short bolt through the upper neck of the connecting rod set in a groove in the pin—is also effective as a means of holding the pin to rock in the lugs. The extreme hollowing of the pin itself too, in connection with the hollow-sectioned connecting rod, also makes an efficient, even excessive, oil delivery to the cylinder walls.

A NEW WAY WITH THE GUDGEON PIN.

But—there are better ways of rigid gudgeon-pin attachment without any bolt that may work loose. One of the simplest, is to cut two fairly deep grooves—or actual slots—lengthwise in the middle of the pin, on opposite sides; each groove rather longer than the head of the connecting rod is wide. Into these grooves or slots insert two pieces of stout brass wire to fit, and clamp the ends over, round the metal of the con-rod head. Now, whether you cut grooves to match, across the interior of the head or not, nothing will shift the pin endwise, and the mere clamping over of the wire-ends will prevent its rocking in the rod-head; while its oscillation in the piston-lugs or bushes will be too slight to shear the wire. Furthermore, if there should not be room originally between the rod-head and piston-lugs for the insertion of these wires, you can afford to make it, even if you cut each lug an eighth of an inch shorter half way round.

However, pins thus rigidly held are supposed to rock in bushes; so I fail to account for the actual absence of anything of the kind in the Duesenberg pistons. But the omission seems hardly worthy of the design and is not reassuring.

CONCERNING LUBRICATION: A THEORY.

Apropos lubrication through hollow gudgeon-pins, we have recently been told by one of those theoretical gentlemen whose practical experience is evidently on the short side, that whatever may be imagined to the contrary it is a fact proved by experiment that there is no motion of the oil around the walls of the piston: that if the oil is ejected from the pin-ends—say east and west—it is not evenly dispersed to north and south; where, we are further told, the pressure between piston and cylinder is greatest; albeit, I may perhaps interpolate the other fact that the pressure happens to be fairly even all round, if these parts have been ground with common accuracy.

We are further told that this "effect" can only be remedied by arranging separate feeds to the points N and S: and that this is a point which generally receives no attention whatever in the design of an aero engine: which would be very sad, if true. Also, that the addition of oil to the petrol "however," causes these parts to be amply lubricated at all points.

Certainly, at all spark-plug points; but nowhere else. And for the rest—merely as a matter of practical universal experience, chemically obvious beforehand—you only spoil your petrol, kill your lubricant, and dry out your running surfaces. That's all for that.

AND THE FACTS OF THE CASE.

Unfortunately for the "fact, proved by experiment," it isn't a fact. Nothing so solid. It is merely a quarter-truth, if so much; an observation to that extent. It may be true; probably is, if the entire scheme of internal lubrication has been designed wrong, with conduits, from main leads none too large, tapering out to a mere delivery of about a quarter of an inch or less so that the mere friction of the oil checks its flow to such a degree that its final trickle is too small to spread much to either side of the pin-ends. Added to which, if the gearing-ratio of the force-pump is inadequate: all these other three-quarters of the alleged truth being conditional and curable. That's the worst of these professors and pundits; they are so constitutionally unable to distinguish between the fundamental and the conditional or accidental; or understand that the experiment merely demonstrates, but never creates, and does not always suggest.

But if, on the other hand, the crank-shaft be so well hollowed that it is one great oil-bag, delivering through ample con-rod conduits, to other oil-bags in the shape of practically tubular gudgeons, and the oil-pump be properly geared and designed—why then the oil will get not only to N and S, but all round the compass. Especially if the pistons have spiral oil grooves, or oil-belts, or star-pockets, or merely wide-ring grooves, as in this case. All of which former physico-mechanical conditions, and one or other of the latter, happen to be those to which practical aeromotor designers who know their job pay special attention, and usually manage to embody. As for instance, in this Duesenberg result.

OIL PUMP DETAIL.

Actually—as the illustration shows very clearly—the lubrication is effected by two pumps of the spur-gear type; or rather by one,



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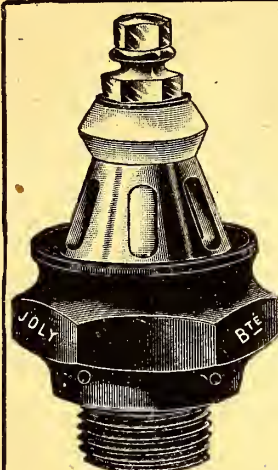
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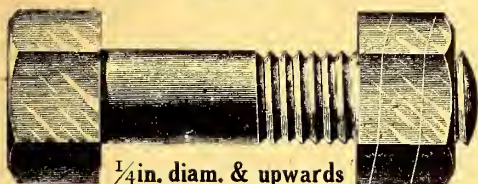
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duplicated into upper and lower halves, duly separated where shown in black, and rotated by a common spindle from worm-gearing above, off the valve-gear-motion system in the usual way. The advantage of this kind of unit-construction will be further admitted, when we notice that the pump-spindle is merely clutched turret-fashion to the short arbor of the pump, so that the whole thing can be detached bodily from the bottom of the oil-sump to which it is bolted; and without disturbing the oil-filter—shown entirely in black—which can also be separately removed.

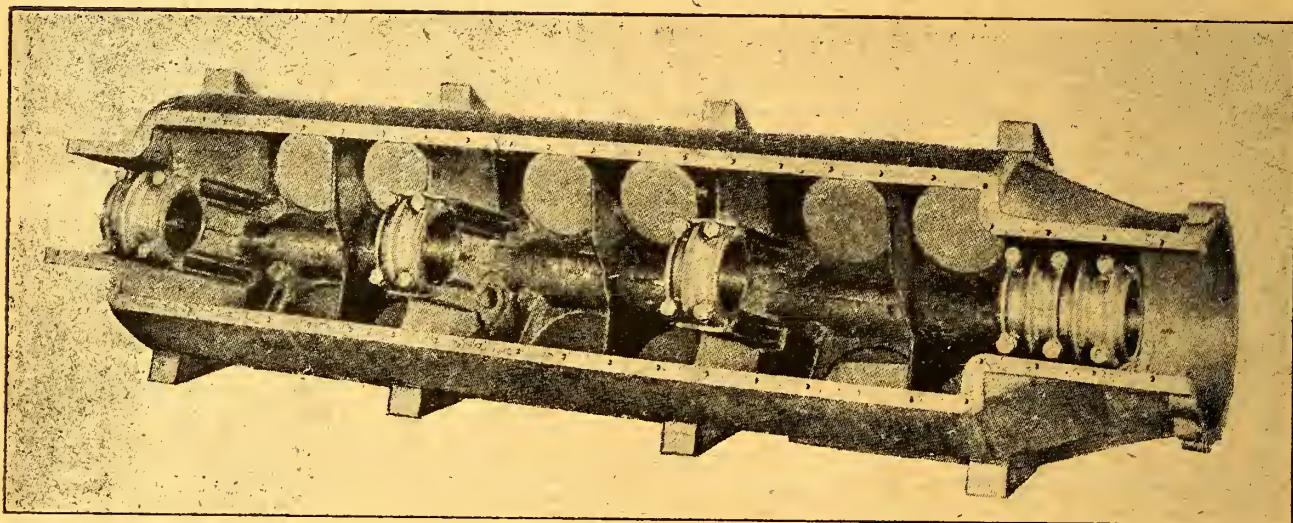
The function of the entire arrangement will be easily seen. Mounted as and where it is, the lower half of the pump can most readily draw the oil from the sump through the filter; and then deliver it to the cooler and external supply tank, from which the upper half can draw the oil, cooled and cleansed, and deliver it to the oil-leads, shaft-bearings; then the hollow shaft-body

itself, and so on through the connecting rods and gudgeons to the cylinder walls in the usual way of such systems.

OTHER CONSTRUCTIONAL FEATURES.

The connecting rods, be it said here, are circular-sectioned forgings of chrome-nickel steel; first roughed out, then annealed and machined to a thirty-second of final size; to which they are again ground after further heat-treatment; when also, they are drilled hollow. Their big-end bearings are of non-granular bronze, babbitt metal lined, and the conventional four cotter-bolt attachment is embodied.

Of course, one consequence of this is that all the rods come to a common standard pattern for cheap repetition. But another—which overbalances it heavily on the wrong side, and is quite unworthy of so fine a design in other respects—is that the cylinders have to be staggered, lengthening the entire motor-mass; and worse still the crank-pins must be lengthened also.

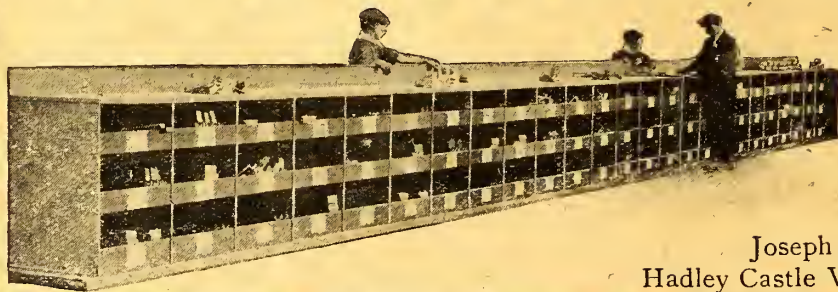


Crank-Case of 300-h.p. Duesenberg engine, showing main ball-bearings.

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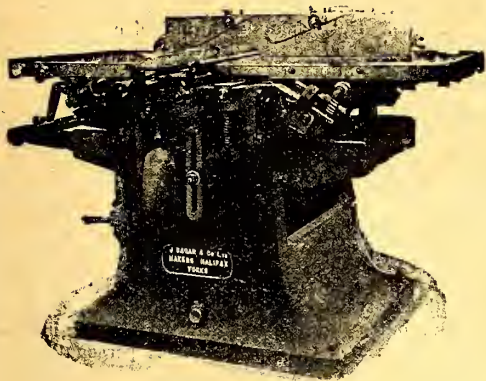
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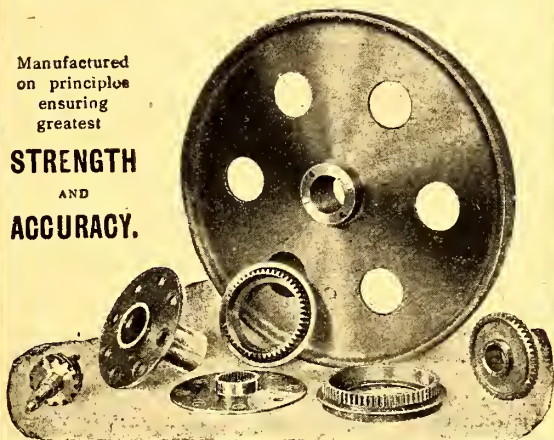
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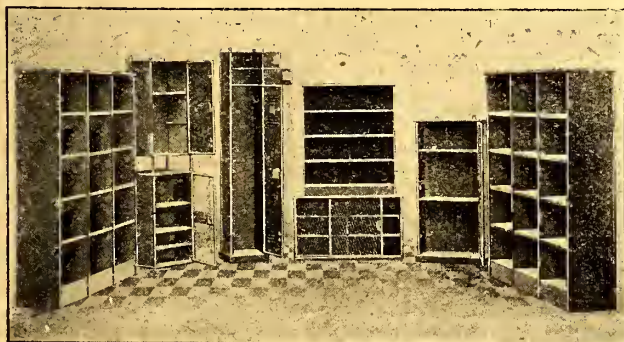
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The easily-made, equally strong, and far more adequate alternative mechanism, which also comes to one standard pattern for all rods, yet does *not* involve these lengthenings, has already been described more than once in these columns.

Otherwise the Duesenberg crank-shaft, with its four main bearings and six crank-pins, of three inches diameter—over 60 per cent. of the cylinder diameter—and its liberal hollowing as an oil-main, is a thoroughly sound job, as to design at any rate. The same may be said of the crank-chamber, with its depth and consequent rigidity; the main thrust bearing being adequately housed at the propeller end, while at the other end are the cam-shaft gearing, and all auxiliaries, such as the electrical generator, used for starting; which is carried on, and housed in the casting of the timing gear-cover, and connected by a Coventry chain in a $1\frac{1}{2}$ to 1-ratio drive, with the crank-shaft: albeit its own relative gear-ratio is 25 to 1.

ACCESSIBILITY—OR VISIBILITY ONLY.

For the rest, this crank-chamber has three detachable panels on each side: but it is a mistake to suppose that these do more than afford visibility without removing the oil-pan: because accessibility, in the sense of being able to get at working parts effectively, can never be sufficiently obtained—and least of all in an aeromotor—unless the entire side of a crank-chamber can be detached bodily. A three inch wide hole into which an electric bulb can be inserted, is enough, at any point. The rest is the illusion of the write-up, to be quite frank.

Remains then only to say that the ignition gear is the usual transverse worm drive arrangement from the cam-shaft end to two 12 point magnetos: each one connecting to all twelve cylinders so as to ensure reliable firing. Also that the water-circulation has likewise been doubly assured by two pumps instead of one.

Which is not conventional. But there we have the extraordinary quality of the Duesenberg design properly expressed. Most departures of value that can be, have been taken; and most consequences logically anticipated. Omissions and defects—of practice rather than radical—exist, and have been noted. But the result is nevertheless, so far advanced of its type as to clamour for repetition in British hands.

(To be continued.)

FLYING AT HENDON.

On Saturday last the weather was exceedingly fine for school work after a long period of bad weather, and the various schools turned it to the best advantage, and on one occasion as many

as 11 machines were in the air at one time. The pilots at the Naval Air Station also took advantage of the fine weather, and one showed his appreciation of the change by looping the loop.

It seems a pity that the interest of the public in aviation is apparently dwindling; it almost looks as if the "chute mortelle" of the stricken Zeppelin has dulled the popular taste for anything less exciting, as advantage is not taken of fine days to visit the aerodrome. But, as a distinguished neutral put it, "It is finer to play in the air than be drowned in the mud, and it is not everyone who can afford to buy a pair of gum-boots for the special purpose of visiting the aerodrome."

A more plausible explanation of the absence of the general public may rest in a general belief that the aerodrome is closed to visitors. This, of course, is not the case, and anyone can obtain admission on the off chance of seeing some really interesting aeroplanes for the small price of a shilling.—W. L. W.

A VACANCY.

There is a vacancy in the office of THE AEROPLANE for an experienced shorthand typist. A young man invalided out of the Army preferred, but applications either from ineligible men or from capable women will be considered. A personal interest in aviation is essential.

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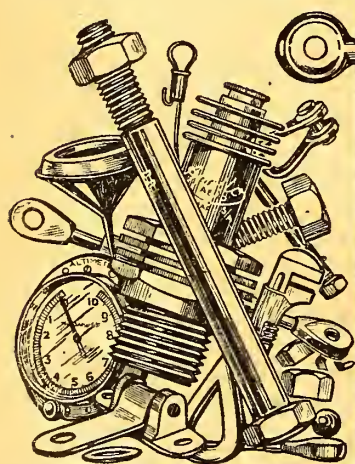
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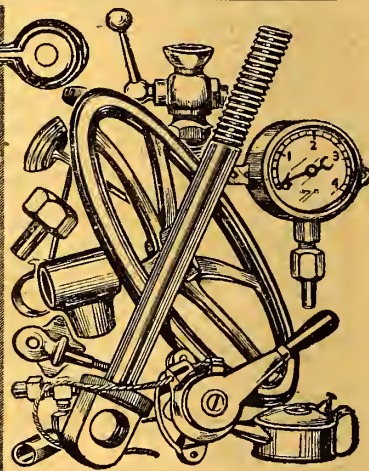
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"Dear Sirs,—S. Smith & Sons (M.A.), Ltd., have a brass clock to repair that was smashed in a motor accident. It was sent to them by Messrs. Lockland & Clarkham, Leeds, and I have written them that they are to have 'Triplex' safety glass fitted to it. Will you take the matter up and see it is done quickly? You charge it to my account. The Insurance pays for the other damage, but the 'Triplex' is an extra.

"I may say that in my opinion, the opinion of the chauffeur driving, the lady injured, the builder of the car, the doctor, the engineer of the Insurance Co., and everyone else, that if it had not been for the Triplex Screen (which I always specify) both passengers would either have been dead or severely carved to pieces; as it is, the only bit of glass in the car not 'Triplex,' viz.: the glass of the above mentioned clock, ripped the lady's leg open down to the bone from the knee, till it met the top of her boot.

"I have told the Car and General they ought to insist on all cars having 'Triplex' fitted and to charge extra premium to those that haven't it.—Yours faithfully, (Signed) REGINALD KNIGHT."

Mr. Knight's enthusiasm seems to be thoroughly justified.

THAT WONDERFUL WIRELESS.

Quite a number of readers of THE AEROPLANE in various parts of the country have sent a remarkable story about someone in Belfast who is the inventor of a wonderful radio-active method of setting fire to Zeppelins while they are yet at a distance, and thus doing away with the need for anti-aircraft guns and night-flying aeroplanes! The yarn takes various forms, and the inventor varies from a Queen's Island workman to a scientist in the Belfast University. Evidently Belfast is suffering from a bad attack of Zeppelinitis!

The story recalls a pre-war incident when a particularly gorgeous joke was worked on the then Minister for War, Colonel Seely. A swindler who called himself McCallum More, who had been convicted on previous occasions for theft under his real name of James Gray, persuaded Colonel Seely that he had a wonderful invention which would short-circuit the magnetos of aeroplanes in the air, and so cause them to descend. A certain amount of Government material was placed at this man Gray's disposal, and on the strength of Government interest in his invention he was able to obtain financial support and credit elsewhere, with the result that he had quite a happy time of it for several weeks, till finally his game began to wear a trifle thin, and he disappeared into space leaving behind him a box of bricks!

Just in case there may be some swindle of a like nature behind the Belfast story readers of THE AEROPLANE will be wise to be on their guard if they are asked to find any money for such an invention.

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The following further cash contributions are acknowledged:—Per Mrs. Samson, £21 10s. 7d.; Commodore Murray F. Sueter, C.B., R.N., £9; Mrs. McLaughlin, £1 1s.; Sqdn.-Comdr. H. Fawcett, £1; total to date, £2,024 11s. 2d. Further contributions in cash and kind should be sent to Mrs. Sueter, The Howe, Watlington, Oxon.

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The following amounts have been received during the week ending Nov. 8th for Muriel Countess Helmsley's and Mrs. Rowton's Fund for Prisoners of War in Germany.—From the employees of Vickers, Ltd., Weybridge Works, £6 11s.; from the employees of Vickers, Ltd., Bexley Heath Works, £3.

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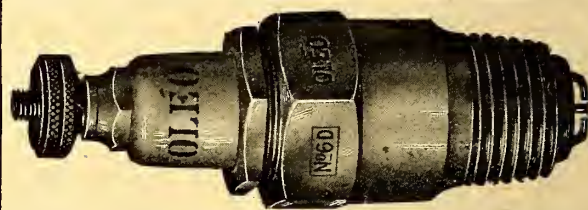
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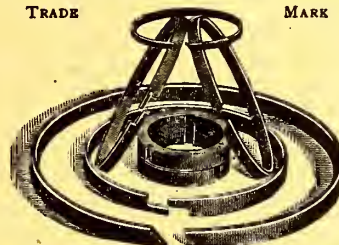
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Editor of THE AEROPLANE.

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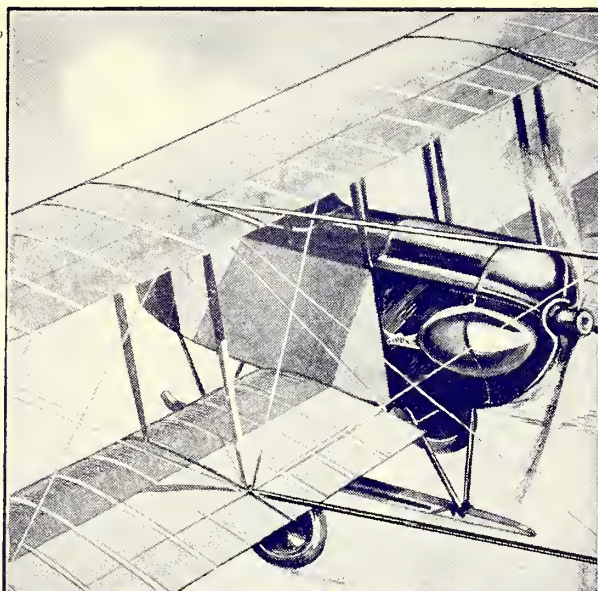
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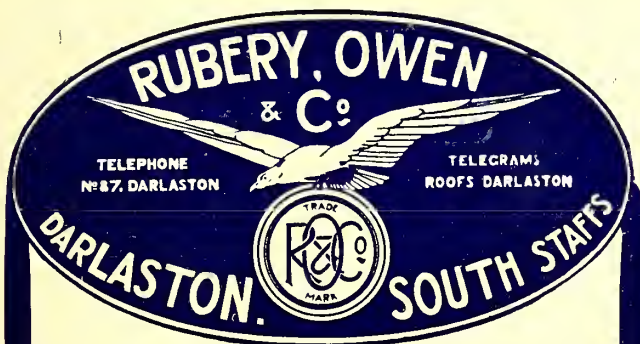
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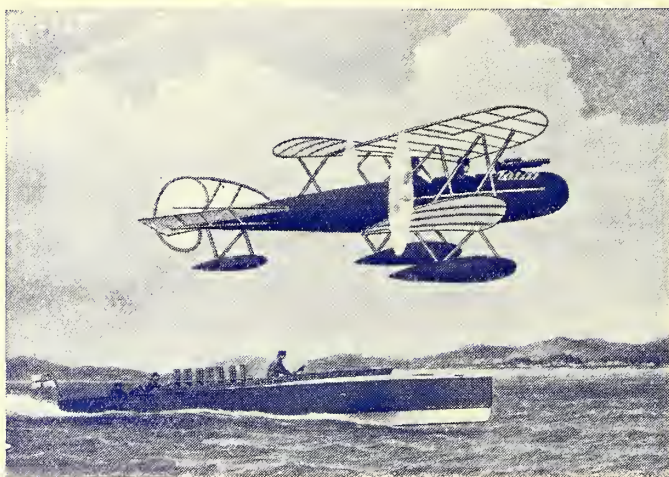
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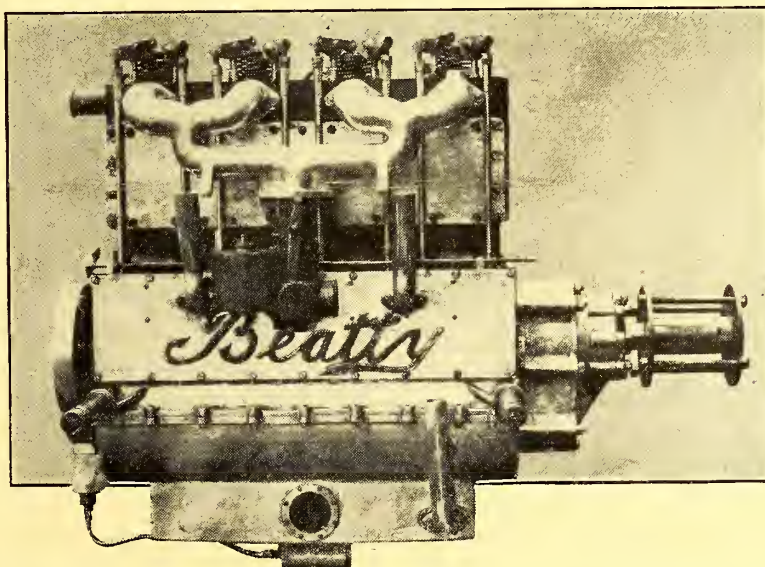
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A FAIR WARNING.

Almost exactly a year ago the R.F.C. in France was suffering heavy losses owing to our pilots being obliged, in order to do the Army's necessary air work, to cross the lines on slow-flying, slow-climbing machines which, although superior in workmanship, and possibly in aerodynamic theory, were inferior in actual war performance to the German Fokker.

The superiority of our officially designed machines was strenuously maintained by those in authority and by the obedient Press which serves the Coalition Government. It was not till after several months of acrimonious controversy and somewhat blatant agitation that matters were improved by the appointment of sundry very capable officers to the real control of the R.F.C.

The report of the Air Committee on the state of affairs which led to this agitation is still unpublished, but however kind its verdict may be to those responsible, the agitation has fulfilled its purpose, to a great extent, by achieving many of the reforms most needed. But there is still room for more reform in the department which deals with choice of material and output.

If these matters are not more capably handled in the course of the next few months it will be necessary for a further inquiry to be held which must involve not only the R.F.C., but the Government as a whole, for the action which must be taken if our forces in France are to regain the command of the air can only become effective if the Government decides to place the control of aeroplane output in the hands of some central authority which can prevent waste by one Service while the other is in need of the material which is being wasted. And this same central authority must also have power to produce in the quickest possible way the particular types of machines required at the immediate moment.

The reason for this statement will become evident when the following facts are considered.

COMMAND OR SUPERIORITY.

For some weeks past a few newspaper correspondents with the British Army in France have let it leak out judiciously that the Germans were making earnest efforts to dispute that command of the air which had been claimed for the R.F.C. for some months before, when journalists wrote of never seeing a German aeroplane from our side of the lines.

The casualty lists showed that the R.F.C. was losing heavily, and G.H.Q. Communiqués openly and wisely admitted the daily losses of machines. The fact that the R.F.C. was attacking on the enemy's side of the lines, and the knowledge that the majority of our engines do not equal those of the Germans in reliability, accounted for many of those who failed to return. But not for all.

My information is that so far from the R.F.C. holding absolute *command* of the air to-day, the Corps is fighting to maintain its superiority. And once more, as it was a year ago, it is almost entirely a question of aeroplanes and engines.

The Germans have produced during the past two months or so a number of small biplanes which have astonishing performances.

There is the new Halberstadt, which is something on the lines of a Morane, but with a much bigger engine—said to be a 240-h.p. Benz. It will be remembered that the Halberstadt works were established in conjunction with the Bristol Co. at a time when our Ministers were telling us that Germany was our best friend, and when the R.F.C. authorities refused to support or encourage British aeronautical enterprise.

There is the small L.V.G., which one who has seen them in the air describes as "a little fat beast, with an enormous engine."

And there is a machine known to our people as the German Spad. This last machine is said to be a copy of the French machine called the Spad, which was designed by M. Béchereau, of the old Deperdussin Co., for the French firm in which M. Blériot is understood to be interested, and officially entitled the "Société Pour les Appareils Deperdussin"—the name of the machine being derived from the firm's initials.

This last machine is said to be built in part, or wholly, in Switzerland, and was presumably copied from samples brought down on the German side of the lines. I am told that it has a narrow chord, a big span for its size, and a pronounced wing curvature, and also that it is very stoutly built, with the result that it is rather heavily loaded for its surface, and therefore manoeuvres very quickly.

All these machines have remarkable climbing power, and are terrifically fast, though their speed is rather because of their big engines than because of their aerodynamic design.

In the days of the Fokker scourge the German pilots used to sit up at 10,000 to 12,000 feet and dive on to our B.E.s. which staggered along at 7,000 to 8,000 feet. To-day, I am told, the new German machines cruise round at anything between 17,000 and 20,000 feet and dive onto such of our machines as cannot exceed 12,000 to 15,000 feet.

The pilots of the R.F.C. know better than anyone how many of our machines can reach 20,000 feet, with present engines tuned by average R.F.C. mechanics. And next to them the Germans know best, from experience.

We at home need not inquire into figures so long as we recognise the fact that once more the Germans have beaten us in reaching the top position, which is to the Service aviator what the "weather gauge" was to our sea captains of the past. And it is our task to help the men at the front to retain their superiority. It is also our duty to bring all possible pressure to bear to help the "efficiency" officers at Adastral House to get what they want for the pilots in France.

TO REGAIN OUR SUPREMACY.

In the first place let it be clearly understood that we have in this country aeroplanes of several types which

are capable of at least equalling the German machines, and are probably able to beat them.

Readers of this paper will remember an incident in which a technical department of the R.F.C., presumably interested in an officially designed machine, ordered that a certain machine was not to be tested without some hundreds of pounds weight of bombs on board—despite which load the “trade” machine beat the official machine. That machine minus its bombs should be more than a match for the Huns’ latest. There are others actually existing, north and south, capable of running it close.

And there are British-made engines in plenty to drive such machines if they are properly allocated by a central authority endowed with the necessary powers by the Government.

At present large numbers of machines are on order for the R.F.C. of types which would have been very valuable nine or ten months ago, but which are now unable to beat the new German machines, or even to meet them on equal terms, just as a year ago there were quantities of B.E.s and other machines on order which were unable to meet the Fokker.

The authorities allowed those contracts of a year ago to be completed and the result was that many useless machines were sent abroad. Later numbers of these machines were “deleted” without ever being flown on service. Much material and thousands of man-hours were wasted in consequence. And the R.F.C. was thus prevented from having early in this year the machines which are now on order.

It remains to be seen whether the officers now in control of the R.F.C. have the power to enforce a drastic change of policy.

The strong policy seems to be to stop all existing contracts after the material now in process of manufacture has been worked up into complete machines. The A.I.D. inspectors at the various factories can furnish, within 24 hours, returns of the number of machines thus to be completed. These “tailings” of material should provide enough machines for the training stations to instruct new pilots in the stages between elementary school machines and the newest superior types. If not, a certain proportion of each contract should be permitted to run on.

This being done, fresh contracts for the new types should be put in hand at once. There should be no waiting for drawings from the firms whose new designs are to be built in quantities. A complete machine, minus engine and fabric, should be sent to each firm which is required to copy the design of another firm, and the parts of that machine should be used as models for jig and tool makers while the copying firm’s draughtsmen are preparing their own drawings. Thus weeks, or even months, of delay may be saved. The new machines should begin to arrive within six weeks of the delivery of the sample machine.

THE ENGINE QUESTION.

The majority of the engines necessary for such machines as can beat the new German machines apparently belong to the Admiralty. One learns that when the Admiralty parts with such engines, reluctantly and under pressure from the Air Board, they still remain Admiralty property till handed over to the Military Wing of the R.F.C., and that neither manufacturers nor the A.I.D. are permitted to make even minor alterations, which would increase efficiency or make them fit their job better.

It is said that quantities, running into hundreds, of such engines are lying in Admiralty stores when they should be immediately available for the R.F.C.

If the R.N.A.S. needed them for any useful purpose one

would not advocate their being taken away, but at the present moment numbers of these engines are being wasted by being put into aeroplanes which are not of the slightest value when built, being useless for war service. These big machines, costing the country thousands of pounds apiece without engines, are being turned out only to be “cast” as useless, as soon as they are handed over to active service squadrons of the R.N.A.S., and without once crossing the enemy’s lines. They are too big and clumsy for school work, and in any case engines of such high power and cost should not be wasted in training pilots.

All these engines should be taken from the Admiralty and used in the new fighting machines of the R.F.C.

WASTE OF MAN-POWER.

Moreover, the factories which are at present wasting labour and material on making utterly useless, and absolutely dangerous, machines for the R.N.A.S. should be turned over at once to making the new type of R.F.C. machines.

Furthermore, a strict inquiry should be instituted at once into the way in which the R.N.A.S. has been conducted during the past year. The blame for the reckless ordering of useless machines should be fixed, and due punishment meted out to those responsible. There is also the little matter of the refusal of the Suiza engine and of the Clergèt to be investigated.

The R.N.A.S. possesses a large number of extraordinarily gallant and skilful pilots and gunner-observers, as well as hundreds of highly skilled mechanics. These should be handed over bodily to the R.F.C., or at any rate attached thereto until such time as the R.N.A.S. comes under the control of people who can use its personnel to advantage.

The R.N.A.S. also possesses many officers of great technical ability and experience. The knowledge of these gentlemen should be available for both Services, whereas at present it is being wasted in an apparently fruitless struggle to bring efficient machines into the R.N.A.S. against the weight of a clique which has wormed its way into official favour—a clique which is ignorant alike of active service needs, of engineering practice, and of aeronautic science.

Only by the adoption of such a strong policy as that outlined above can we hope to keep our supremacy in the air when the war begins again in the spring. Useless machines, and still more useless men, must be ruthlessly scrapped. The Germans are reorganising the personnel of their Flying Service, and have placed it under General von Höppner, whose name one recalls dimly as being concerned with good work in the past. They have already reorganised their design, as those who read these notes may judge, and one is inclined to think that they have reorganised their output, for I am told that an observer behind the British lines a week or two ago counted over fifty German aeroplanes in view at one time.

So much for our “command of the air,” which for a while deprived British troops of the sight of a single German aeroplane, and deprived German gunners of the ability to correct their shooting.

We can keep our command is the really capable officers in both the Flying Services are adequately supported by the Government, and if the incompetents are deprived of their power for harm. At any rate, if the present chaotic and wasteful state of things is allowed to continue, and if we lose even our present superiority, and if we revert to our inferiority of a year ago, this precious Government cannot plead that it has not had a fair warning.—C. G. G.

On a Few Practical Points and Suggestions.

One of the greatest difficulties in running a technical paper in these days is that fact that, if one discusses technical matters which can be of any real value to one's technical readers, the discussion must be of greater value to the enemy than to our own people. For all British papers reach Germany through neutral countries at some time or other.

British aircraft designers can, to some extent, meet and exchange views on novel points of design or construction, but the results of their discussions cannot be reported in print because anything which such a report would teach to other designers would also be taught to enemy designers.

As a matter of fact, British designers do not make the best of the possibilities of personal meetings and discussions. The Aeronautical Society's meetings have been in abeyance since the beginning of the war, owing to the moving spirits of the Society being too busy on military or munition work to arrange or attend such meetings, and thus a valuable method of exchanging ideas has been lost.

I venture to suggest that it would be well worth the while of the Aeronautical Society's Council and the Council of the Society of British Aircraft Constructors to consult together as to the advisability of instituting a series of meetings and discussions for the benefit of the younger generation of aircraft engineers. Possibly the technical departments of the R.N.A.S. and R.F.C. might be induced to augment the value of such meetings by detailing certain technical officers, essentially those with active service experience, to lay before such meetings various troubles in aeroplanes and engines which

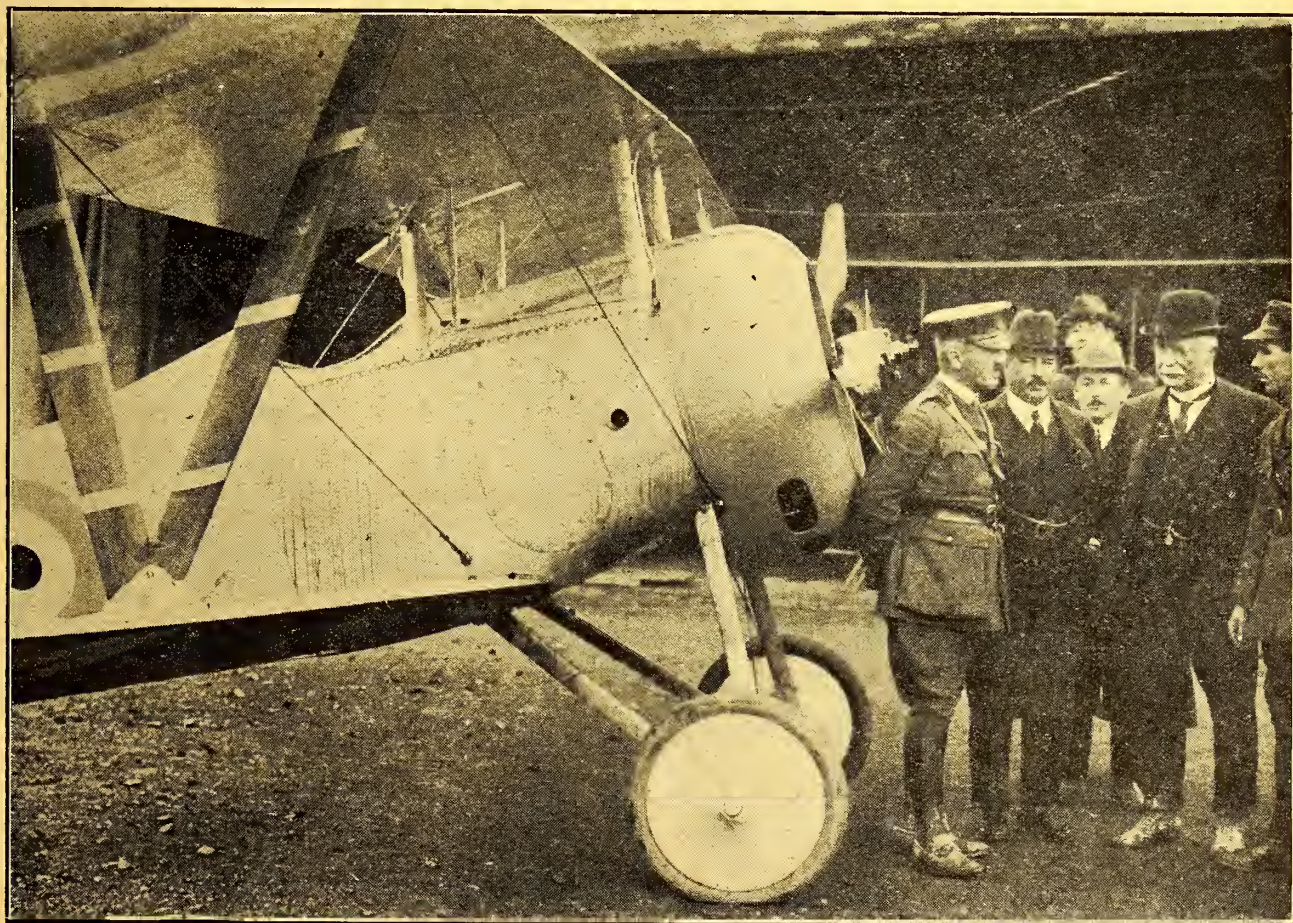
hamper the work of air mechanics and pilots alike. And such meetings ought to be careful to steer clear of the usual "technical society" type of discussion.

The meetings of the Aeronautical Society before the war were of two distinct types. There were the purely military meetings, at which soldiers of experience set forth in plain language the needs of military aviators, and asked the technical people to consider how best to build aeroplanes to meet those needs.

One remembers particularly the highly interesting papers read by General Henderson and Colonel Sykes, and meetings at which such distinguished officers as the late Sir James Grierson, Sir John French (as he then was), and Lord Sydenham presided, wherein the presidential address gave food for thought as valuable as did the paper of the evening. These meetings were intensely interesting, and opened up entirely new points of view, both for the pioneer aircraft constructors and for their junior assistants.

There seems no reason why papers of a similarly practical nature, only made still more valuable by the experience of two years of war, should not be read by experienced officers. In fact, consideration must show that such a method of educating the younger designers and constructors in the latest needs of the Flying Services should be part of the duties of the technical departments of the Services.

The setting forth of the latest developments of aerial warfare, or of defects in commonly used designs disclosed by modern uses of aeroplanes, would certainly produce a number of valuable suggestions from trained engineers who have come into the aircraft industry in the past two



Mr. Massey, Premier of New Zealand, inspecting a modern French biplane, and photographed officially in the act.

years, and those who might be too nervous or too shy to stand up before a meeting and speak their suggestions should be invited to send their ideas in writing to the Aeronautical Society for private circulation to the Services and the Industry.

SOMETHING TO BE AVOIDED.

The other type of meeting was that at which young men, sometimes in Government employ, and generally occupying some pseudo-scientific position, used to get up and spout out volumes of figures and formulæ which meant nothing to anybody except themselves and their collaborators. They illustrated their lectures with sheets upon sheets of weird diagrams, complicated figures, and incomprehensible curves. They spoke a language which seemed to be a compound of Board School Cockney and Molesworth's Pocket-Book. Their grammar was generally vile, and their collars frequently did not fit. They were neither pleasing to look at nor instructive to hear.

One may obtain at once much priceless entertainment and instruction from a conversation with a skilled mechanic who really knows his job, but who is entirely ignorant of syntax or pronunciation. The first-class working engineer is one of the finest products of this country, though he is becoming scarce now that proper apprenticeships are dying out, and that merited physical punishment of slack or insubordinate juniors is esteemed by our feeble legislators as common assault. But the non-educated, machine-crammed, local-polytechnic, would-be-scientific product of these later days is a blot upon creation. Unfortunately he is precisely the type which is most eager to get on its hind legs and hear itself talk.

If this type were allowed to occupy the time of such meetings as I have suggested, either as lecturer or discussor, all the practical men would simply become bored, and either go to sleep or go out, and the whole purpose of the meetings would be destroyed. And, moreover, all these slide-rule merchants and figure-shifters between them have not done as much to produce the modern highly effective British aeroplane as has been done by any one of half a dozen rule-of-thumb engineers in aircraft factories who have designed improvements by eye.

THE ADVANTAGE TO THE INDUSTRY.

The Aircraft Industry, busy as it is, would find that it would pay very well to send its draughtsmen, designers, foremen, and charge-hands to listen to papers read, say, once a fortnight by men who knew their subjects.

The draughtsman and foreman are, as a rule, right out of touch with naval and military aviation. The draughtsman is chiefly concerned with making calculations fit together, and the foreman is generally concerned with trying his best to make aeroplanes fit together after the parts have been made to the drawings produced from the draughtsman's calculations.

From what one can learn, aeronautical draughtsmen are particularly notable for their sublime ignorance of workshop practice, and have a genius for turning out drawings of things which cannot possibly be made in the manner indicated on paper. I used to think that the R.A.F. had made a corner in all the bad draughtsmen in England, but either the corner has been broken, and the bad draughtsmen have been dispersed throughout the Industry and Services, or else the supply is unlimited. At any rate, I hear that drawings from the R.N.A.S. Drawing Department and from the R.F.C. at Adastral House are worse than anything the R.A.F. ever did. If officialdom doubts me, let it study how to get the rollers into a Scarff Ring as per drawings supplied. Also, I have seen some fairly fearsome efforts by Trade draughtsmen, and sundry friends of mine in the shops tell me that they curse their own drawing-offices as heartily as they do any Government department.

Of a verity the draughtsman, who is frequently merely a bad workman who prefers a black coat to a khaki one, needs a great deal of education, and it would be very good for him to be obliged by his employer to go one evening a fortnight to listen to a lecture by an active service technical officer or by a practical designer. It would be much better for him than lounging in the local music-hall, or along the local High Street, smoking cigarettes.

There might be some difficulty in persuading firms of aircraft makers to allow their designers or constructors to read papers, or during the subsequent discussion to make suggestions for improvements. One hears of petty jealousies between men, or companies, or squadrons, or battalions, or even General Officers in the Field, and one cannot wonder, therefore, that, in spite of the war, there is still jealousy between firms of aircraft constructors.

One believes that the meetings of the Council of the Society of British Aircraft Constructors are doing much to remove such jealousies; but though Mr. Snooks, managing director of one firm, may go out for a friendly lunch with Mr. Jooks, proprietor of another firm, it is quite a different matter when Mr. Snooks' chief designer wants to get up and instruct Mr. Jooks' chief constructor in the practice of building aeroplanes, for then Mr. Jooks is not merely being fed by Mr. Snooks; he is actually obtaining for his firm information of permanent value which Mr. Snooks' designer has acquired at Mr. Snooks' expense.

In an ideal moral and social state, where no man was for himself, but all were for the commonweal, each man's first thought on producing a good idea would be to transmit it at once to everyone in his particular sphere of activity, but such a beautiful community of ideas is never likely to be—outside Utopia. Therefore one can only suggest that the chief men of the Aircraft Industry consider seriously how far they can pool ideas of scientific or military value for the immediate good of the Flying Services, and for the ultimate good of the British Aircraft Industry. For the better the work the whole Industry does during the war the stronger its position will be after the war—when the Aircraft Industry's real fight for existence will begin.

The Aircraft Industry is really fighting for the Conquest of the Air, and its position is not unlike that of a battalion attacking the enemy. The fastest and strongest man may distinguish himself highly by dashing ahead of the rest, but his life will be safer, and he will hold his ultimate position more firmly, if he takes the wiser course of helping the weaker or slower men to keep up with him, so that they may be there to support him when he has reached his maximum effort for the time being, and when the reaction begins to set in.

MATTERS FOR DISCUSSION.

There cannot be much risk of the enemy profiting in this matter, if one indicates roughly the kind of subject that might be discussed at such meetings as have been suggested.

There is, for example, the question of "top pressure" in highly efficient high-powered machines. If an aeroplane is designed to reach its best speed at, say, 10,000 feet, at which height it flies at its most efficient angle, that machine may be dangerous to fly at full power when near the ground. When the engine is opened up, the machine will try to climb, and the pilot has to hold its nose down to make it fly level. This means that it has, in many cases, to fly at a negative angle, with the result that there is an immense downward pressure on the top of the wings in front, and that the whole lift is transferred backwards on the wing, so that the rear spars may have to lift not only the whole weight of the machine, but the supplementary weight of the downward pressure in front. It therefore

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seems that the front spar of each wing is being pressed down and the rear spar pressed up, and so that the whole wing is being severely twisted.

If a machine of this kind has a long overhang, or extension, to the upper wings, there seems to be a probability that the spars will twist off, as they are not supported by interplane struts and incidence wires. Several accidents have already happened which lead one to believe that such top pressure was their cause.

In one case the extensions distinctly folded downwards, and the crew of two were killed; though apparently, if the pilot had held on a straight course and had not attempted to turn, he might have landed safely.

In the other case, the extensions are said to have folded upwards, and in this instance the pilot, who was alone, escaped unhurt. His escape had about it a certain grim humour, for he was unable to reach a landing ground, and came down on the roof of a lunatic asylum. Immediately on hitting the roof, the machine caught fire, and the pilot retired to the other end of the roof and watched it burn. It is alleged that he then discovered a skylight and dropped through it, to find himself in a padded cell. My informant was unable to say whether the cell had already a tenant or not, but he appeared to think that the end of the adventure was somewhat apposite.

THE FUSELAGE AND TAIL QUESTION.

There have also recently been instances of fuselages and tails breaking in the air, and these accidents have also been ascribed to the presence of too much power.

To prevent the machine from climbing, as mentioned before, the nose is held down, and the tail is held up by the elevator. Apart from the strain on the elevator, caused by dragging it through the air at well over 100 miles an hour, while it is doing its best to trail straight out behind, the fact of the tail being thus held up must put a powerful downward pressure on the fixed tail plane.

It is said that in one instance the ends of the tail plane distinctly folded downwards, outside the tubular stays which held it up to the rudder post. The machine, which was only 150 feet or so from the ground, promptly dived and killed the pilot.

In another case the fuselage longerons, or longitudinal members, broke, apparently upwards. This was taken as indicating that the down pressure from the wings, or the endeavours of the machine to climb, tried to force the fuselage downwards while the elevator was forcing it upwards, and so the fuselage broke, just at its junction with the tail plane.

AN ALTERNATIVE CAUSE.

Naturally, to obtain the enormous speeds and astonishing climbs of modern aeroplanes, the machines themselves must be cut extremely light. The Germans, with their huge engines, have been able to produce very fine performances from fairly heavy machines, but even they have evidently suffered in the same way, for one constantly hears of German aeroplanes collapsing in the air while diving after, or away from, British machines. The Fokker has been particularly bad in this respect, which will seem natural to anyone who has inspected these machines closely, and has noticed some of the terrible detail work.

In any case, it is natural that very lightly built machines should need very careful handling, either in the air or on the ground.

It seems, therefore, quite likely that some of the accidents which have been blamed onto defective workmanship or material might equally justly be blamed onto bad piloting or bad training of pilots. I remember a distinguished R.F.C. officer once describing another officer's method of landing thus: "So-and-so says to himself, here's an aeroplane, there's a field. One's got

to go on top of the other. Let's put it there. And he does!" Quite a number of pilots land that way still.

Some of them come into a field full split, hit the ground with their wheels at 60 or 70 miles an hour, crash their tail-skids onto the ground, and then wonder why the fuselage breaks and drops them on their backs with the front of the machine on top of them.

Others try to do the "stand-still" landing, popularised by the late Gustav Hamel, with the result that they land on all fours, or perhaps hit with the tail-skid first. In either case the main weights of the machine are thrown amidships of the fuselage, which is bound to snap unless it is strong and heavy. And whether in the slow or fast landing, a broken fuselage probably means broken legs as well.

GROUND DAMAGE.

One of the most likely causes of light machines breaking in the air is this same rough handling on the ground. Suppose a pilot has landed in either of the ways described, and has snapped a wire or cracked a strut or longeron. Or suppose he has merely taxied fast over rough ground, with the same resultant damage. He may fly for hours, or even weeks, and make many more landings on the same machine, but the time will surely come when, in some fierce manoeuvre in an air fight or in practice, the weakened fuselage will give way and the tail will apparently fall off in the air.

One has heard of such things happening, but one has not heard whether the fuselage fabric was opened and the internal structure inspected after every landing—as should be the case with all light, high-powered machines. A fuselage and tail may be fully strong for all flying strains, and yet not calculated to stand shock-loading in bumpy landings.

A still more fatal habit with some pilots is, if they make a bad landing, to go up again without stopping and have another try. If the first landing is really bad, it has probably damaged something, and that is an excellent reason for stopping on the ground to make sure. In the old days, two or three Blériot pilots or pupils were killed from precisely that cause. The lower *planche*, which was not then reinforced by steel strip, used to crack in landing, and, being timber in tension, used to let the wing stays fold up as soon as it got a bump aloft.

THE LIMIT IN LIGHTNESS.

If one could go into figures and weights, one might publish some quite interesting facts about the weights of modern aeroplanes and the weights of engine, crew, guns, fuel, and munitions which they carry. If one could do so, pilots might take a little more care about their landings.

Also, and quite incidentally, if every air-mechanic were liable to go aloft as passenger in any aeroplane which he had just repaired or adjusted, it is probable that he would take very much greater care over his work.

In any case, it seems probable that we have nearly reached the limit in lightness in actual aeroplane construction, unless someone can discover some entirely new material, with the strength of steel and in other respects the qualities of whalebone. I trust I may not thus instigate some German professor to discover synthetic whalebone and cross it with duralumin.

However, there are certainly two points which designers and constructors might well discuss among themselves, if such meetings as have been suggested cannot be held. Firstly, are aeroplanes too rigid, and is it possible to give greater flexibility, especially in the fuselage? And, secondly, ought not fuselages to be built of stouter material near the tail than farther forward, where bracing wires are at better angles, owing to the bigger dimensions of the girder structure?

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THE ENGINE QUESTION.

Assuming that we have reached the limit of lightness in the aeroplane structure, it seems that the only direction in which better performance can be obtained is towards lightening the engines.

A month or so ago a friend of mine got out some figures about past performances in the hope of discovering whether there was any strong argument in favour of heavy engines with low fuel consumption, or of light engines with big fuel consumption, for it is a fairly general rule that the very light air-cooled engines use far more fuel in a given time than do the heavy water-cooled engines. He found that the honours were so nearly evenly divided that it was impossible to prefer any particular form of engine.

Writing to me on this subject, he said:

"It does show at least one thing that I have been convinced of for some time, and that is, petrol economy is of no advantage unless the engine is equally light with this economy.

"What I mean is that the uneconomical ultra-light motor of, say, 110 h.p. has proved itself capable of carrying the same useful load as many economical heavy-weight motors of even 200 h.p., and the light motor has, further, often resulted in a much faster machine.

"Therefore petrol consumption per brake-horse-power developed is not a correct indication of economy if the increased petrol is necessarily used up in carrying the greater load, and the proper test for an aero-engine is petrol consumption per distance travelled in the aeroplane, and in proportion to the useful load carried.

"This is a point that appears to me has often been overlooked in engine design, and modern practice goes to prove that it is not possible to build as light a machine with a heavy engine as with a light engine.

"What I mean by this is that, if the engine is 100 lbs. heavier, the machine is not just 100 lbs. heavier; but the fuselage has to be strengthened, heavier engine-bearers fitted, and this often results in larger wings, surfaces, etc., with the final result that the heavier engine in the heavy machine is not more economical per distance travelled and per load carried than the very light engine in the light machine."

An interesting point arises from this. If two machines, one with a heavy but economical engine, and one with

a light but extravagant engine, both weigh the same when loaded with fuel for, say, six hours flying—which is about the point at which the loads coincide in most cases—the lighter engine, burning more fuel, will grow steadily lighter than the other, with the result that, when they both reach their field of operations in a matter of three hours or so, the machine with the lighter engine will be far lighter altogether than the other, and so will be the more easily able to climb and manœuvre quickly when it gets there.

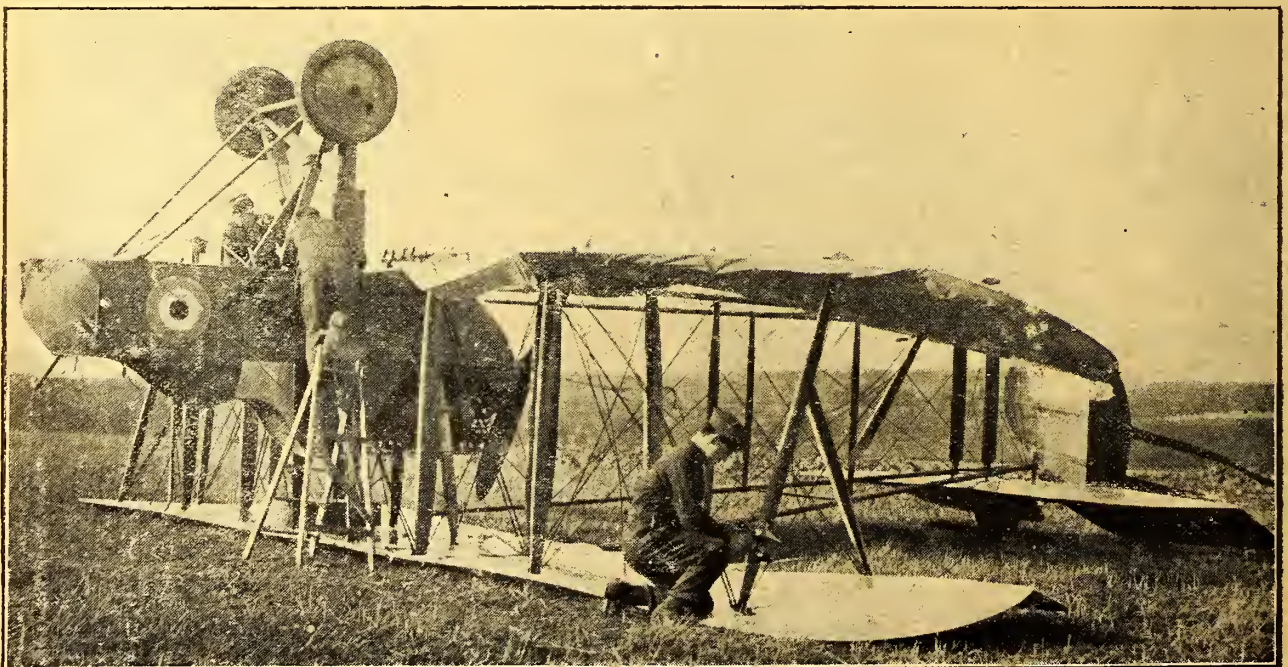
Even on a longer journey, where the heavy-engined machine would be notably lighter at the start, it might still be worth while to use the lighter engine with the bigger petrol load, even if doing so meant that the machine could barely stagger off the ground, for on reaching its objective it would again be much lighter than the heavy engine, and better able to climb and manœuvre.

This would be particularly the case of machines starting at night on a bombing raid, or of seaplanes raiding a distant base, but obviously it would not apply to machines starting in daylight over enemy lines, where they would be liable to attack soon after leaving home. The light but extravagant engine thus seems particularly suited for fighting machines intended to escort bomb-droppers.

There seems to be a distinct limit in size, at about 150 h.p., to rotary engines, for one could not contemplate with equanimity the spectacle of any much bigger mass than that of a Clergét whirling round on the nose of a small machine, and, furthermore, the mere diameter of a bigger engine would terribly complicate the propeller problem. It is probable that there is an equally clear limit, in other types, to the size of all air-cooled engines. But up to that limit the light-weight air-cooled seems to score.

Beyond that, for single power-units, the water-cooled engine has things all its own way, though it still remains to be proved whether four separate air-cooled engines of 150 h.p. each may not give better service than one engine of 200 h.p., in addition to giving chances of return in case of the breakdown of one engine.

For bomb-raiding it would thus appear that big machines with heavy economical engines of high power should carry the bombs, and should be accompanied by



An official photograph of an official biplane turned over recently in a gale.

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light-engined fighting machines, for when the bombs had been dropped the machines would then be lightened to something like the same extent as the fighting machines which had been burning more petrol per horse-power. Which is about what happens in practice.

On the whole, also, the heavy water-cooled engine is at present more reliable over very long distance than the lighter air-cooled engine, and so is more favoured for long reconnaissances, especially by the Germans.

In a subsequent letter the designer already quoted says: "Fortunately, most of our light motors are being made more economical every day. My point is that I feel convinced that, even if the lighter engine is less economical, it makes a better utility machine, whereas so many critics are interesting engine manufacturers purely on the score of petrol consumption, and this is sure to have a detrimental effect upon the future aeroplane."

Here, then, is further ground for discussion between engine designers, carburettor specialists, metallurgists, machinists, lubricationists, and all those concerned with engine production. What improvements can be made in light air-cooled engines to make them more economical? What can be done to lighten water-cooled engines? Is it really necessary to carry gallons of water aloft, merely to keep an engine from overheating? Cannot engines be run hotter than they are—*vide* the Antoinette? What about higher thermal efficiency and freedom from fire with paraffin carburettors? And what are the possibilities of a semi-Diesel aircraft-engine, with consequent freedom from magneto and plug troubles?

One sees material for some very pretty arguments if debates on these subjects could be arranged, and especially if speakers could be mutually guaranteed against actions for libel and slander if they spoke openly.

THE R.N.A.S. COMFORTS FUND.

The note in last week's *AEROPLANE* seems to have assisted in bringing some new subscriptions to the R.N.A.S. Comforts Fund. It is sincerely to be hoped that its effects will not stay here, and that it will be possible to record fresh contributions next week.

Special thanks are due to Mrs. Hetherington and the Colchester War Work Depot for a magnificent gift of warm garments, and to Mr. W. Chapman Waller, who has sent his fifth cash contribution of £10.

The following contributions are gratefully acknowledged by the Hon. Treasurer of the Fund:—Mrs. Holt Thomas, £10; Mr. W. Chapman Waller, £10 (5th contribution); Mr. Alfred Grafton, £3 3s.; Mrs. Elder, £2 2s.; Col. Sir George and Hon. Lady Barker, £2; Col. Gessit, R.E., and F. W. H., £2; Lady Flower, £1 1s.; Miss Low, £1; Mrs. Gerrard, 10s.; Miss A. M., 5s.; total to date, £2,058 12s. 2d.

Further contributions in cash and kind should be sent to Mrs. Sucter, The Howe, Watlington, Oxon.

THE AERONAUTICAL PICTURE SHOW.

The opening of the Exhibition of Aeronautical Pictures, in aid of the Irish Hospitals Depot Fund, and of the Flying Services Fund, organised by the Countess of Drogheda, has been postponed owing to a change in the locality of the exhibition. Lady Drogheda found that the Knoedler Galleries were not suited to display the number of pictures which her friends offered her as soon as the scope of the show became known, and so the exhibits have been removed to more commodious premises, and the whole exhibition is being enlarged in scope.

The delay in opening is to be regretted, but it is all to the advantage of the exhibition as such, for the interest of the prints and paintings, ancient and modern, is simply astonishing, and it would have been a great pity if many of the exhibits had been crowded out or skied for lack of room.

Lady Drogheda has personally produced a most elaborate and thorough catalogue for the show, which gives a brief history of each picture or of the subject depicted. Mr. H. G. Wells has contributed a prophetic preface, Lady Drogheda has written an account of the development of war-balloons and of parachutes, and there is also a tabloid history of aeronautics in general for the benefit of the uninitiated.

The date of opening will be announced as soon as possible.

CENSORSHIP.

Finally, let me again remind my readers of the difficulties of publishing really technical matter of any real value. The Censorship is apparently no safeguard to the country in such matters, for there does not seem to be any technical department in the Press Bureau.

If I said that Captain John Smith had gone to join No. 187 Squadron R.F.C. in France, I should probably be suppressed for publishing the number of a military unit and its station. But if I published a really important formula which would be of high value to all aeroplane designers at home and abroad, the chances are that it would pass unnoticed.

Even in censoring pictures, no understandable method can be seen. Recently I sent a picture of an obsolete R.E.7 and of a monocoque Morane of quite ancient design to the Press Bureau, and they were returned marked "Not to be Published." Yet a couple of months ago the Press Bureau itself issued for publication a photograph of a whole bunch of much newer Moranes, and this week there appear in this paper two official photographs of aeroplanes of far more recent date than either the R.E.7 or the Morane. So what can one do for one, as it were?—as Mr. Robert Hale used to say.

Possibly some day someone will try to impress newcomers to the Aircraft Industry by publishing strings of figures which look imposing and mean nothing—that is how scientific reputations are made—but it may be taken as an axiom that any technical matter which is published is not worth publishing, and anything that is worth publishing ought not to be published, in the country's interests. Meantime I reserve to myself the right to publish purely elementary technical articles for the babes and sucklings of aeronautical drawing offices; but if I do I can guarantee that no experienced aeronautical engineer will find them of the slightest use.

C. G. G.

QUESTIONS IN THE HOUSE.

On Nov. 15th, in reply to Mr. Pemberton-Billing, Major Baird says the total number of fatal accidents from all causes in the R.F.C. Military Wing, in this country in the last 12 months was 98.

* * *

On Nov. 15th Mr. Bonar Law, asked by Mr. Pemberton-Billing whether the First Lord of the Admiralty threatened to tender his resignation if the Royal Naval Air Service was included in the recent air inquiry, and whether the Lords of the Admiralty had threatened to tender their resignation if any steps were taken to remove from the sphere of their control the Royal Naval Air Service, said:—The answer to both parts of the question is in the negative.

* * *

In reply to a question by Capt. Bennett-Goldney on Nov. 15th as to the report of the Air Board, the Prime Minister said:—

"The first report by the President of the Air Board is a document of a highly secret character. So far as my own knowledge and responsibility extend, its contents have only been communicated to members of the War Committee, and are engaging the Committee's close attention. The report embodies certain proposals and recommendations affecting at least three Departments—the Admiralty, the War Office, and the Ministry of Munitions—whose considered views on those recommendations have yet to be submitted to the War Committee. I hope to be in a position shortly to make a statement in the House on the subject. I certainly do not think it desirable that the report in its entirety should be laid on the table. I am not prepared at present to state whether or not it is advisable that the Board's proposals should be discussed in Secret Session."

AIR BOARD.

There are likely to be developments in the Air Board crisis during the next few days. It is common knowledge that the Air Board has asked for more extended powers. It has, however, been freely stated in the Lobby that the Admiralty maintain their opposition to any substantial change in the existing state of things. The final decision rests with the War Committee and the Cabinet.

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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Nov. 14th, 1916.

ADMIRALTY, Nov. 9th.

R.N.A.S.—Temp. Prob. Flt. Sub-Lts. to be temp. Flt. Sub-Lts.:—A. T. O. Mann, Nov. 6th, 1915. J. A. B. Ball, Nov. 15th, 1915. H. S. Murton, Feb. 11th. H. B. Brenton, Feb. 24th. J. K. Cronyn, March 1st. W. Lodge, March 19th. D. H. Masson, March 21st. W. M. Alexander, March 23rd. L. G. Maxton, I. P. Millar, W. Houston-Stewart, April 30th. H. A. Wilson, May 9th. W. L. Anderson, May 10th. J. E. Ruthven, May 14th. E. A. Bennetts, May 28th. C. T. Brimer, June 7th. J. W. Chuter, June 11th. L. G. Steel, June 18th. H. L. Gaskell, June 25th. R. S. Whigham, June 28th. M. W. Buckley, L. E. B. Wimbush, July 5th. L. H. Brake, July 20th.

WAR OFFICE, Nov. 14th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers.—Sec. Lt. (temp. Lt.) H. W. Hepburn, Manch. R., T.F.; temp. Sec. Lt. (on prob.) H. E. Rahtkens, Gen. List, Oct. 22nd. Lt. G. W. Devenish, R.A., from a Flying Officer (Observer), with seny. from July 1st; Sec. Lt. (temp. Lt.) P. J. Long, A.S.C., and to be secd.; temp. Sec. Lt. J. W. Shaw, Oxf. and Bucks L.I., and to be transfd. to Gen. List, Oct. 25th. Sec. Lt. C. C. White, Spec. Res., Oct. 26th. Temp. Lt. H. W. Woollett, Linc. R., and to be transfd. to Gen. List; temp. Sec. Lt. T. H. Elliott, R.A., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) G. F. Turberville, Gen. List; Lt. J. D. Belgrave, Oxf. and Bucks L.I., and to be secd.; Sec. Lt. A. F. Quinlan, R. W. Kent R., and to be secd.; temp. Sec. Lt. A. S. Keep, R. War. R., and to be transfd. to Gen. List, Oct. 27th.

Equipment Officers, 3rd Cl.—Sec. Lt. (temp. Capt.) J. C. Briggs, Leic. R., T.F.; temp. Sec. Lt. (on prob.) J. S. Berdoo, Gen. List; Sec. Lt. (on prob.) G. Dennison, Spec. Res., Sec. Lt. (on prob.) H. L. U. Clark, Spec. Res., Sec. Lt. (on prob.) G. Urquhart, Spec. Res., Oct. 30th. Temp. Sec. Lt. (on prob.) H. Dear, Gen. List, Oct. 31st. Sec. Lt. E. E. Cutts, Spec. Res., Nov. 2nd.

MEMORANDA.—To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Sgt. J. H. Thorpe, Sept. 12th. Sec. Cl. Air Mech. W. H. Scanlan, from R.N.A.S., Sept. 26th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) E. D. Doring resigns his commn., Nov. 15th. Sec. Lts. (on prob.) confirmed in their rank:—C. C. White, E. S. Halford, C. Curwen, C. C. Bracebridge, R. W. Davies, E. Holloway, A. Hingston.

TERRITORIAL FORCE.—R.F.A.—HOME COUNTIES BDE.—Sec. Lt. W. J. Potts is secd. for duty with the R.F.C., Oct. 31st.

WELSH BDE.—Lt. (temp. Capt.) S. Hooper is secd. for duty with the R.F.C., Oct. 31st.

* * *

From the "London Gazette" Supplement, Nov. 14th, 1916.

His Majesty the King has been graciously pleased to approve of the appointments of the following Officers to be Companions of the Distinguished Service Order, in recognition of their gallantry and devotion to duty in the Field:—

Sec. Lt. PATRICK ANTHONY LANGAN-BYRNE, R.A. and R.F.C.—He has shown great pluck in attacking hostile machines, often against large odds. He has accounted for several. On one occasion, with two other machines, he attacked 17 enemy machines, shot down one in flames and forced another to land.

Sec. Lt. CLAUDE ALWARD RIDLEY, M.C., R. Fus. and R.F.C.—For judgment in the execution of a special mission. When his machine was wrecked, he showed great resource, and obtained valuable information.

His Majesty the King has been graciously pleased to confer the Military Cross on the undermentioned Officers in recognition of their gallantry and devotion to duty in the Field:—

Capt. CHARLES HUBERT BOULBY BLOUNT, R.W. Surr. R. and R.F.C.—He has organised the contact patrol work of a new squadron, and has carried out valuable work in the air himself. On one occasion he flew for a long time at about 500 ft. under heavy fire to locate a battalion which was lost.

Sec. Lt. ARTHUR VIVIAN BURBURY, York. R. and R.F.C.—When observing from a balloon at a height of 3,000 feet the cable was cut by a shell. He destroyed his papers, ripped the balloon, a most difficult operation in the air, and then got down in his parachute.

Sec. Lt. PATRICK COLIN CAMPBELL, Arg. and Suth'd Highrs., Spec. Res. and R.F.C.—For conspicuous skill and gallantry on many occasions. On one occasion, seeing a cavalry patrol held up, he came down to 600 ft., dropped bombs on the enemy and enabled his observer to enfilade the hostile trench with machine-gun fire. Finally, his engine was put out of action by rifle fire from the ground.

Temp. Capt. REGINALD CHADWICK, R.F.C.—He dived down to a low altitude, attacking a train, displaying great courage and determination.

Lt. SYDNEY HERBERT CLARKE, Wilts R., Spec. Res. and R.F.C.—He has done fine photographic work, often working far over the lines and being heavily attacked by superior numbers of enemy machines. On one occasion, with another officer, he brought down one of five enemy machines which had attacked him.

Sec. Lt. IVAN CURLEWIS, R.F.C.—He attacked an enemy machine which he drove off. Later, he destroyed an enemy machine and brought down a balloon under very heavy fire, displaying great courage and determination throughout.

Temp. Lt. WILLIAM GEORGE SELLAR CURPHEY, Gen. List and R.F.C.—He brought down an enemy machine, and two days later attacked and brought down another. He has frequently attacked formations of hostile aircraft and driven them down.

Sec. Lt. CHESTER STAIRS DUFFUS, R.F.C., Spec. Res.—For conspicuous skill and gallantry in fights with hostile aircraft. On one occasion, after hard fighting, he brought down a hostile machine in flames on our side of the line.

Temp. Lt. (temp. Capt.) ERNEST LESLIE FOOT, Gen. List and R.F.C.—For conspicuous skill and gallantry. When flying a single-seater scout he dived on to five hostile machines, which were flying at about 2,500 ft., and drove one to the ground as a wreck. On many other occasions he has shown great determination when fighting enemy machines.

Lt. ROBERT PARSONS HARVEY, 5th Lrs. and R.F.C.—He attacked four hostile machines with great courage and skill, his observer shooting one of them down. He has on many previous occasions done very fine work.

Temp. Sec. Lt. RODERIC MAXWELL HILL, North'd Fus. and R.F.C.—For conspicuous skill and gallantry. Under very heavy fire he dived at an enemy balloon and brought it down in flames. On the day before he had dived at a balloon under heavy fire at a low altitude, but had just missed his mark.

Sec. Lt. CHARLES STANLEY HOLLINGHURST, R.F.C., Spec. Res.—For conspicuous skill and gallantry on contact patrol work. On one occasion he was attacked first by four and then by three enemy machines, but drove them all off and continued his patrol. On another occasion his observer was hit, and his machine badly damaged by anti-aircraft fire, but he came back for another machine, and went out again. Two days later he was wounded by flying over the lines at 1,000 feet.

Sec. Lt. ROBERT JAMES HUDSON, R. Fus., Spec. Res. and R.F.C.—He carried out artillery reconnaissances with great courage and determination. Later, on three occasions, diving to a low altitude, he engaged parties of infantry with his machine-gun.

Sec. Lt. RALPH HENSWORTH JARVIS, R.F.C., Spec. Res.—While observing, he engaged and drove off three enemy machines, after which he returned and completed work. Later, he carried out a valuable reconnaissance during a very strong gale. He has on many previous occasions done fine work.

Sec. Lt. LEONARD CAMERON KIDD, R.F.C., Spec. Res.—For conspicuous skill and gallantry on contact patrol work. On one occasion he carried out three contact patrol flights, each 1,000 ft., and obtained valuable information under heavy fire. He also attacked enemy reinforcements with a machine-gun from a height of 500 ft.

Sec. Lt. ARTHUR GERALD KNIGHT, R.F.C., Spec. Res.—He has shown great pluck in fights with enemy machines, and has accounted for several. On one occasion, when a hostile machine was interfering with a reconnaissance, he attacked at very close range, and brought down the enemy machine in flames.

Lt. THOMAS EATON LANDER, High. L.I. and R.F.C.—For conspicuous gallantry and skill in an encounter with an enemy machine. By skilful manœuvring, Lt. Lander and Sec. Lt. Barr drove down the enemy machine behind the enemy's lines in a damaged condition.

Sec. Lt. CECIL ARTHUR LEWIS, R.F.C., Spec. Res.—For conspicuous skill and gallantry. He has done fine work in photography, with artillery and on contact patrols. On one occasion he came down very low and attacked a column of horsed limbers, causing casualties and scattering the limbers.

Temp. Sec. Lt. FREDERICK LIBBY, Gen. List and R.F.C.—As observer, he, with his pilot, attacked four hostile machines and shot one down. He has previously shot down four enemy machines.

Temp. Sec. Lt. FRANCIS STEELE MOLLER, Gen. List and R.F.C.—During a raid he dived to 1,500 ft., and dropped his bombs on an ammunition train. He then chased three other trains, and attacked them with great courage and skill.

Sec. Lt. (temp. Capt.) ROGER HENRY GARTSIDE NEVILLE, D. of Corn. L.I. and R.F.C.—He is a fine leader of patrol work, and has done much to keep enemy machines away from our lines. On one occasion, flying in a rain storm, after nearly colliding with an enemy machine, he pursued it and brought it down half a mile from an enemy aerodrome.

TESTED and ADOPTED by the ADMIRALTY

PATENT

VISLOK

PATENT

Reliable Safety Lock Nut

**"OVER EIGHT MILLION DIRECT IMPACTS
STILL AS TIGHT AS ON THE DAY
THEY WERE FITTED."**

**All other
Government Depts.
having tested
and adopted Vislok,
we invite
Aero Dept.
to make an
Official Test.**

STAFFORD,
ENGLAND.

"We have just completed our first test of the 'Vislok' Tappet Nuts you made for the Dorman Totally Enclosed Type of Engine. The Motor to which these nuts were fitted has within the last fortnight been run for a distance of 2,000 miles, and during this period each individual nut has received over eight million direct impacts from the valve lifting mechanism, and we are pleased to be able to state that they are still as tight as on the day they were fitted"

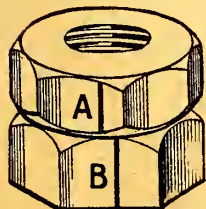
W. H. DORMAN & CO., Ltd.,
Motor Engine Specialists.

**Why run needless risks
when Security can be Guaranteed?**

Mr. W. J. SMITH, C.E., Engineer and Surveyor, Market Harborough, writes on May 8, 1916:

"Some time ago I called at your works to say that I found the greatest difficulty in keeping the Ordinary nuts securely fastened upon our 10-ton STEAM ROAD ROLLER and SCARIFIER.

"Your men at my request fitted the VISLOK, and after NINE MONTHS almost daily rolling and scarifying, in some cases pulling up tar macadam surfaces, there has not been found one loose Vislok, neither has my engineman, during that period had to tighten a single Vislok, and to-day they appear as fast as the first day they were fixed"

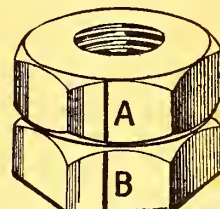


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VISLOK Ltd.

3, ST. BRIDE'S HOUSE,
SALISBURY SQUARE, E.C.



UNLOCKED

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Temp Lt. SYDNEY ESMOND O'HANLON, Gen. List and R.F.C.—As observer, on many occasions, he has rendered most valuable reports, displaying great courage and determination throughout.

Sec. Lt. THOMAS SYDNEY PEARSON, R.A. and R.F.C.—He has done fine contact patrol work. On one occasion, with another officer as pilot, he flew for a long time at about 500 ft. under heavy rifle fire in order to locate a lost battalion.

Sec. Lt. GEORGE PHILIPPI, Dns., Spec. Res. and R.F.C.—He dived at a hostile balloon under heavy fire and brought it down in flames. Though wounded in the head, he brought his machine back at a low altitude, and landed safely in his aerodrome.

Sec. Lt. (temp. Lt.) GEOFFREY WARD ROBERTS, R.F., Spec. Res. and R.F.C.—For conspicuous skill and gallantry when attacking hostile machines. On one occasion, when on offensive patrol, he brought down two machines.

Sec. Lt. HUGH ANSELM BOULTON ROBB, R.F.C., Spec. Res.—He has done fine artillery work in all weathers. On one occasion, while flying a new type of machine, his engine failed, but he glided back over the lines under heavy fire, and landed his machine without damage on ground pitted with shell holes.

Sec. Lt. ARTHUR JOHN GRAHAM SEYRAN, R.A. and R.F.C.—He has done fine work with artillery for a long time, often in bad weather and under heavy fire. On one occasion he directed the fire of nine batteries on the enemy's trenches, and obtained a large number of direct hits.

Lt. (temp. Capt.) JOHN HUGH SAMUEL TYSSSEN, N. Som. Yeo. and R.F.C.—For conspicuous skill and gallantry. He has done fine work in photography, often fighting against odds in order to get his work done. On one occasion, when five enemy machines interfered with our patrol, he, with another officer, dived at one and brought it down.

Capt. ADOLPH ANDRE WALSER, Lond. R. and R.F.C.—He carried out a most valuable artillery reconnaissance under very heavy fire, displaying great courage and determination. He has on many previous occasions done fine work.

Temp. Sec. Lt. JOHN SCOTT WILLIAMS, Gen. List and R.F.C.—For conspicuous skill and gallantry when attacking enemy machines. On one occasion, with another officer as pilot, he brought down two enemy machines.

Temp. Sec. Lt. GEOFFREY HUNTER WOOD, Gen. List, attd. R.F.C.—He has continually done contact patrol work, obtaining most valuable information, and displaying great courage and determination throughout.

Sec. Lt. CHARLES HENRY CHAPMAN WOOLLVEN, Devon. R. and R.F.C.—He dived down to a low altitude, attacked a train, causing many casualties, and displayed great courage and determination throughout.

Sec. Lt. (temp. Capt.) CHARLES SERVICE WORKMAN, Sco. Rif. and R.F.C.—He and his pilot dived down to a low altitude, attacked a train, causing many casualties, and displayed great courage and determination.

The following has been awarded a 2nd Bar to his Military Cross for a subsequent act of conspicuous gallantry:—

Sec. Lt. (temp. Capt.) SIDNEY EDWARD COWAN, M.C., R.F.C., Spec. Res.—He fought a long contest with seven enemy machines, finally bringing one down in flames. He has displayed great

skill and gallantry throughout. (M.C. awarded in "Gazette" dated May 31st, 1916. The 1st Bar awarded in "Gazette" dated Oct. 20th, 1916.)

The following has been awarded a Bar to his Military Cross for subsequent acts of conspicuous gallantry:—

Sec. Lt. (temp. Lt.) MALCOLM GLASSFORD BEGG, M.C., Rif. Bde., Spec. Res. and R.F.C.—He has on many occasions carried out successful contact patrol work at low altitudes, rendering most valuable reports and displaying great courage and determination. (M.C. awarded in "Gazette" dated Sept. 22nd, 1916.)

* * *

From the "London Gazette" Supplement, Nov. 15th, 1916.

WAR OFFICE, Nov. 15th.

REGULAR FORCES. — ESTABLISHMENTS. — R.F.C. — Flt. Comdrs.—From Flying Officers.—Temp. Lt. A. W. Keen, Gen. List, and to be temp. Capt. whilst so empld., Oct. 22nd. Capt. T. Mapplebeck, L'pool R., S.R., Nov. 1st. Lt. A. D. Bell-Irving, M.C., Gord. Highrs., S.R., and to be temp. Capt. whilst so empld., Nov. 3rd.

Flying Officers.—Temp. Sec. Lt. J. W. L. Birkbeck, Durh. L.I., and to be transf'd. to Gen. List, Oct. 20th. Sec. Lt. C. G. Brodie, Lond. R., T.F.; Sec. Lt. C. T. L. Donaldson, Queen's Own Glasgow Yeo., T.F.; Sec. Lt. T. R. C. Birkin, 7th D.G., and to be sec'd.; temp. Sec. Lt. (on prob.) J. FitzHugh, Gen. List, Oct. 26th. Temp. Sec. Lt. J. P. Morkam, North'n R.; temp. Sec. Lt. (on prob.) R. K. Jenkins, Gen. List; Sec. Lt. (on prob.) M. Johnstone, S.R.; Capt. W. Ashton, Worc. R., S.R., and to be sec'd.; Sec. Lt. L. G. D'Arcy, Conn. Rang., S.R., and to be sec'd., Oct. 27th. Sec. Lt. J. E. Edgar, S.R., Oct. 28th. Sec. Lt. F. O. Baxter, Ind. Army Res. of Off.; Sec. Lt. (on prob.) W. H. Cox, R. Fus., S.R., and to be sec'd.; Sec. Lt. (temp. Lt.) O. E. Ridewood, S. Wales Mtd. Brig., A.S.C., T.F.; Sec. Lt. D. E. P. Chaplin, R.A., and to be sec'd., Oct. 29th. Sec. Lt. (temp. Lt.) C. E. M. Pickthorn, A.S.C., S.R., from a Flying Officer (Observer), with seny. from June 25th; Sec. Lt. H. G. M. Horne, Lond. R., T.F.; temp. Sec. Lt. (on prob.) J. E. Blake, R.E.; temp. Sec. Lt. F. Bissicks, Gen. List, Oct. 31st.

Equipment Officers, 2nd Cl.—From Equipment Officers, 3rd Cl.—Lt. E. W. J. Payne, S.R.; Sec. Lt. O. H. Frost, Midd'x R., T.F., and to be temp. Lt. whilst so empld.; Sec. Lt. B. F. Crane, S.R., and to be temp. Lt. whilst so empld., Nov. 1st. Lt. V. F. P. Bryce, S.R., Nov. 4th.

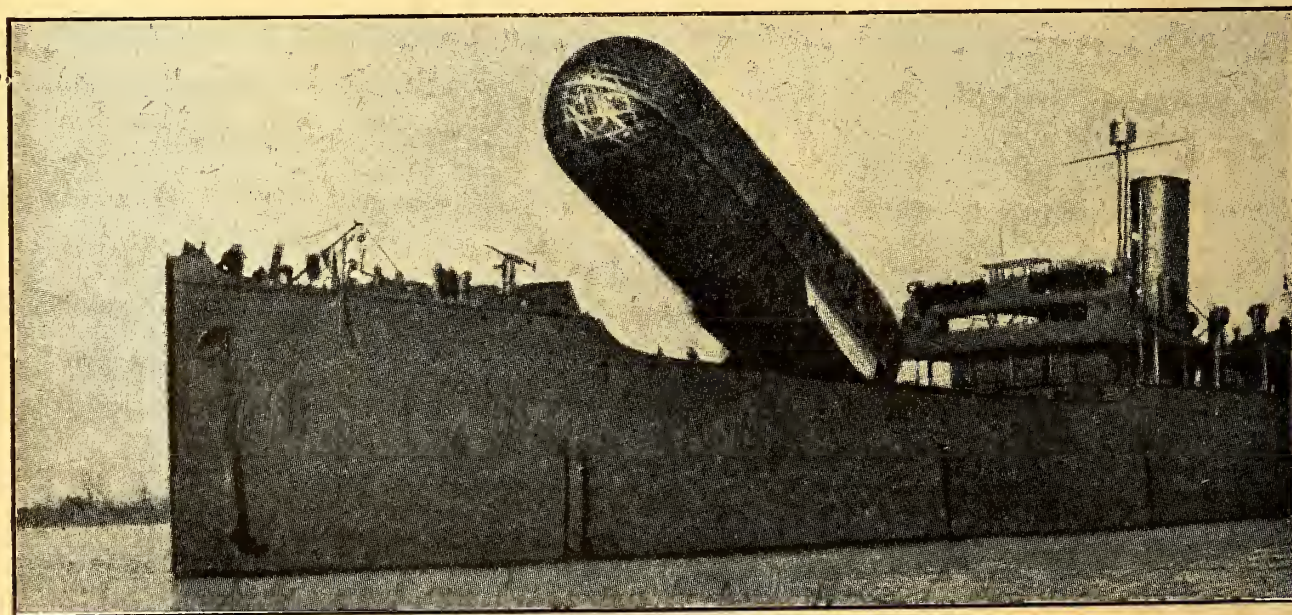
CAVALRY.—10TH HRS.—Sec. Lt. R. H. Peto is sec'd. whilst empld. with R.F.C., Sept. 1st.

MEMORANDA.—Capt. and Bt. Maj. J. G., Marquess of Tullibardine, M.V.O., D.S.O. (Lt.-Col. Comdt., Sco. Horse Yeo., T.F.), reverts to the h.p. list., Oct. 27th, 1916.

Cdt. D. G. Robinson to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Sept. 10th.

Jeejeebhoy Piroshaw Bomanjee Jeejeebhoy to be temp. Hon. Sec. Lt. on Gen. List for duty with R.F.C., Nov. 6th.

SPECIAL RESERVE OF OFFICERS. — SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—MIL. WING.—The following Sec. Lts. (on prob.) are confirmed in their rank:—J. E. Edgar, N. L. Knight. To be Sec. Lts. (on prob.):—P. R. Aitken, Oct. 27th. W. G. Duffield, Oct. 28th.



From "The Scientific American."

ON ACTIVE SERVICE.—A British Naval kite-balloon in the act of rising from the hold of the kite-balloon ship. Note the anti-aircraft gun on the forecastle.

"Shell" No.1 Motor Spirit

**TEMPORARY WITHDRAWAL from
Public Sale for Motoring purposes.
Entire Supply practically absorbed by
Government Aviation Needs.**

**"Shell" II and "Crown" Motor Spirits
still procurable everywhere.**

With the thoughts and energies of the Empire concentrated upon winning the war, it will readily be appreciated that precedence in obtaining supplies of the world's finest motor spirit must be given to His Majesty's Forces and those of our Allies, particularly the vitally-important Aircraft branches which have so splendidly established our air supremacy. Their requirements, together with those of our submarine fleet, practically absorb the supplies of "Shell" I, upon which the Government relies for its Aircraft services.

The Proprietors of "Shell" Motor Spirit are accordingly forced temporarily to withdraw "Shell" I from sale for all purposes other than aviation, except in cases where petrol-gas lighting and other plants have been installed on the understanding of an unfailing supply of the highest-grade motor spirit being available.

In taking this step, the Proprietors know they may fully rely upon the co-operation of the motoring public in releasing "Shell" I for the above acute national needs, and in the direction of substituting "Shell" II until the situation improves and the Company is again able to supply the quality for which so marked a preference has been shown.

Notwithstanding the heavy demand for "Shell" Spirit of all grades for the Allied Forces, we are able, by increasing the supply of "Shell" II and "Crown" Motor Spirits to the full extent of the withdrawal of the high-grade "Shell" I quality, to meet the whole of the public requirements, merely withholding "Shell" I from sale for pleasure motoring purposes whilst the above position continues.

The "London Gazette" Supplement, Nov. 16th, 1916.

WAR OFFICE, Nov. 16th.

REGULAR FORCES. — ESTABLISHMENTS. — R.F.C. — Flt. Comdrs. (from Flying Officers, and to be temp. Capts. whilst so empd.).—Lt. T. L. Mallory, Lan. Fus., Spec. Res., Nov. 2nd. Temp. Sec. Lt. W. L. Clark, Gen. List, Nov. 3rd.

Equipment Officers, 3rd Cl.—Lt. (temp. Capt.) G. F. Lucas, York R., T.F., temp. Sec. Lt. W. J. King, Gen. List. Sec. Lts., Spec. Res.:—C. C. Bracebridge, C. Curwen, R. W. Davies, A. Hingston, E. Holloway, E. S. Halford, Oct. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. E. F. Allen relinquishes his commn., Nov. 17th.

TERRITORIAL FORCE.—INFANTRY.—MIDD. R.—Sec. Lt. A. R. Wilkie is secd. for duty with the R.F.C., Oct. 26th.

MANCH. R.—Lt. H. W. Hepburn is secd. for duty with the R.F.C., Oct. 22nd.

LOND. R.—Sec. Lt. G. F. Bishop is secd. for duty with the R.F.C., Oct. 24th. Sec. Lt. (temp. Lt.) B. D. Higman is secd. for duty with the R.F.C., Oct. 26th.

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From the "London Gazette," Nov. 17th, 1916.

WAR OFFICE, Nov. 17th.

REGULAR FORCES. — ESTABLISHMENTS.—INFANTRY.—ARG. AND SUTH'D HIGHRS.—S. G. Rome, M.C., June 7th, and to be secd. from Aug. 26th for service with R.F.C.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) confirmed in their rank:—M. Johnstone, C. S. O'Grady, A. C. Kiddie, G. T. Pettigrew, J. H. B. Foss, G. D. Harrison. To be Sec. Lts. (on prob.): A. Burgess, Oct. 24th. F. W. Elstub, Nov. 2nd. O. C. Holleran, Nov. 6th.

TERRITORIAL FORCE.—INFANTRY:—ROYAL WARWICK R.—Sec. Lt. (temp. Lt.) W. D. South is secd. for duty with the R.F.C., Aug. 1st.

LIVERPOOL R.—Lt. S. E. Goodwin is secd. for duty with the R.F.C., Oct. 8th.

CHESHIRE R.—Capt. W. W. Leete is secd. for duty with the R.F.C., Oct. 20th.

EAST SURREY R.—Sec. Lt. (temp. Lt.) C. A. H. Mason is secd. for duty with the R.F.C., Oct. 18th.

WEST RIDING R.—Sec. Lt. R. H. Rayner is secd. for duty with the R.F.C., Oct. 12th.

MANCHESTER R.—Sec. Lt. F. L. Fletcher is secd. for duty with the R.F.C., Sept. 13th.

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From the "London Gazette" Supplement, Nov. 18th, 1916.

WAR OFFICE, Nov. 18th.

REGULAR FORCES.—Wt., N.C.Os., and men to be temp. Sec. Lts. (on prob.):—MEMORANDA.—For duty with R.F.C.—Col.-Sgt.-Maj. Instr. G. B. Neale, from Lond. R., T.F., Cpl. C. J. Strother, from R.F.C., Cpl. C. H. Parker, from R.F.C., Pte. F. P. Lambert, from Lond. R., T.F., Oct. 15th. Staff Sgt. T. J. Legate, from Can. Infy. Brig., Sgt. F. G. Brockman, from Lond. R., T.F., 1st Cl. Air Mech. C. J. Pell, from R.F.C., Pte. T. B. Jones, from Can. Corps, Cav. R., Oct. 16th. Mech. Staff Sgt. R. Cameron, from A.S.C., Pte. L. L. Brown, from Can. Divnl. Supply Col., Oct. 17th. Staff Sgt. N. Liddall, from A.S.C., Oct. 20th. Cpl. J. G. Plester, from R.F.C., Oct. 21st. Cpl. A. M. Turnbull, from R.E., Oct. 22nd. Actg. Sqdrn. Sgt.-Maj. W. R. P. Allen, from North'n Yeo., T.F., Sgt. L. G. Fauvel, from York Dns., T.F., L.-Cpl. H. C. Reade, from Shrop. L.I., 2nd Cl. Air Mech. A. H. Steele, from R.F.C., Oct. 23rd.

ESTABLISHMENTS.—Flying Officers.—Sec. Lt. F. G. Russell, R.F.A., Spec. Res., from a Flying Officer (Observer), with seny. from Mar. 24th (Oct. 30th).

Lt. (temp. Capt.) S. Hooper, R.F.A., T.F.; Sec. Lt. W. J. Potts, R.F.A., T.F.; Sec. Lt. G. T. Pettigrew, Spec. Res.; Sec. Lt. C. S. O'Grady, Spec. Res.; Sec. Lt. A. C. Kiddie, Spec. Res.; temp. Sec. Lt. P. C. E. Johnson, Gen. List, Oct. 31st.

TERRITORIAL FORCE.—INFANTRY.—ROYAL SUSSEX REGT.—Sec. Lt. (temp. Lt.) K. M. Cantley is now seconded for duty with the R.F.C., Oct. 26th, 1916.

* * *

From the "London Gazette" Supplement, Nov. 20th, 1916.

WAR OFFICE, Nov. 20th.

REGULAR FORCES. — ESTABLISHMENTS. — R.F.C. — Flying Officers.—Temp. Sec. Lt. P. H. Davy, Yorks L.I., and to be transfd. to Gen. List, Nov. 1st. Capt. C. W. Rowe, Hunts Cyclist Bn., T.F.; Sec. Lt. (on prob.) J. D. V. Holmes, Spec. Res.; temp. Sec. Lt. M. A. Kay, Gen. List, Nov. 2nd. Sec. Lt. (temp. Lt.) C. W. Short, M.C., Ind. Army Res. of Officers, Nov. 3rd, seny. from May 30th.

Equipment Officers, 3rd Cl.—Temp. Sec. Lt. (on prob.) R. E. Wakelin, Essex R., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) H. S. Wilkins, Gen. List. Sec. Lts., Spec. Res.:—R. M. Ward, D. A. Pearson, A. W. Barlow. Sec. Lts. (on prob.), Spec. Res.:—J. Page, T. M. Wilson, R. G. Watts, G. Barfoot-Saunt, J. Farquharson, A. E. Blackmore, S. F. Feast,

G. T. Bridgewater, Oct. 31st. Temp. Sec. Lt. S. Mills, Gen. List, Nov. 3rd.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—MIL. WING.—Sec. Lts. (on prob.) confirmed in rank:—A. W. Barlow, D. A. Pearson, R. M. Ward.

TERRITORIAL FORCE.—R.F.A.—W. LANCs. BRIG.—Sec. Lt. (temp. Lt.) R. W. P. Hall is secd. for duty with the R.F.C., Oct. 24th.

INFANTRY.—L.N. LANCs. R.—Sec. Lt. (temp. Lt.) W. R. Haggas is secd. for duty with the R.F.C., Oct. 8th.

CYCLIST BNS.—Capt. C. W. Rowe is secd. for duty with the R.F.C., Nov. 2nd, 1916. Sec. Lt. (temp. Capt.) C. Ingram (attd. Prov. Bn.) is now secd. for duty with the R.F.C., Oct. 12th, 1916.

* * *

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Nov. 14th.

The following Officer had the honour of being received, when His Majesty conferred upon him the Military Cross: Capt. C. A. RIDLEY, Royal Fusiliers and R.F.C.

BUCKINGHAM PALACE, Nov. 16th.

The following had the honour of being received by His Majesty, when the King handed to him, as "Next-of-Kin," the Victoria Cross won by his relative in the War:—

MR. JOHN LIDDELL.—Awarded to his son, Capt. John Aidan Liddell, Princess Louise's (Argyll and Sutherland Highlanders), and Royal Flying Corps:

For most conspicuous bravery and devotion to duty.

When on a flying reconnaissance he was severely wounded (his right thigh being broken), which caused momentary unconsciousness, but by a great effort he regained partial control after his machine had dropped nearly 3,000 feet, and notwithstanding his collapsed state succeeded, although continually fired at, in completing his course and brought the aeroplane into our lines—half an hour after he had been wounded.

The difficulties experienced by this officer in saving his machine, and the life of his observer, cannot be readily expressed, but as the control wheel and throttle control were smashed, and also one of the under-carriage struts, it would seem incredible that he could have accomplished his task.

BUCKINGHAM PALACE, Nov. 18th.

The following Officer had the honour of being received by the King this morning, when His Majesty invested him with the Insignia of Companion of the Order into which he has been admitted:—

THE DISTINGUISHED SERVICE ORDER AND TWO BARS.

Capt. ALBERT BALL, Sherwood Foresters, attached R.F.C.

The King then conferred the following decoration:—

THE ALBERT MEDAL (FIRST CLASS).

Lt. FREDERICK RUTLAND, R.N. (Flt. Lt., R.N.A.S.).

During the transhipment of the crew of H.M.S. "Warrior" to H.M.S. "Engadine" on the morning of June 1st, 1916, succeeding the naval battle off the coast of Jutland, one of the severely wounded, owing to the violent motion of the two ships, was accidentally dropped overboard from a stretcher and fell between the ships. As the ships were working most dangerously, the Commanding Officer of the "Warrior" had to forbid two of his officers from jumping overboard to the rescue of the wounded man, as he considered that it would mean their almost certain death. Before he could be observed, however, Lt. Rutland, of H.M.S. "Engadine," went overboard from the forepart of that ship with a bowline, and worked himself aft. He succeeded in putting the bowline around the wounded man and in getting him hauled on board, but it was then found that the man was dead, having been crushed between the two ships. Lt. Rutland's escape from a similar fate was miraculous. His bravery is reported to have been magnificent.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Nov. 16th.—Mr. E. G. Walker, granted temp. commn. as Lieut. (R.N.V.R.), seny. Nov. 14th.

Nov. 20th.—Lt.-Comdr. (R.N.V.R. temp.).—G. Holmes, promoted rank of Comdr. (temp.), seny. Nov. 16th.

Nov. 21st.—The following have been entered as Proby. Flt. Officers (temp.), seny. as follows:—H. Nixon, Nov. 19th. F. D. J. Silwood and G. F. F. Read, Nov. 26th.

Mr. P. M. Davson granted a temp. commission as Sub-Lt. (R.N.V.R.), seny. Nov. 18th, and apptd. to "President," addl., for R.N.A.S.

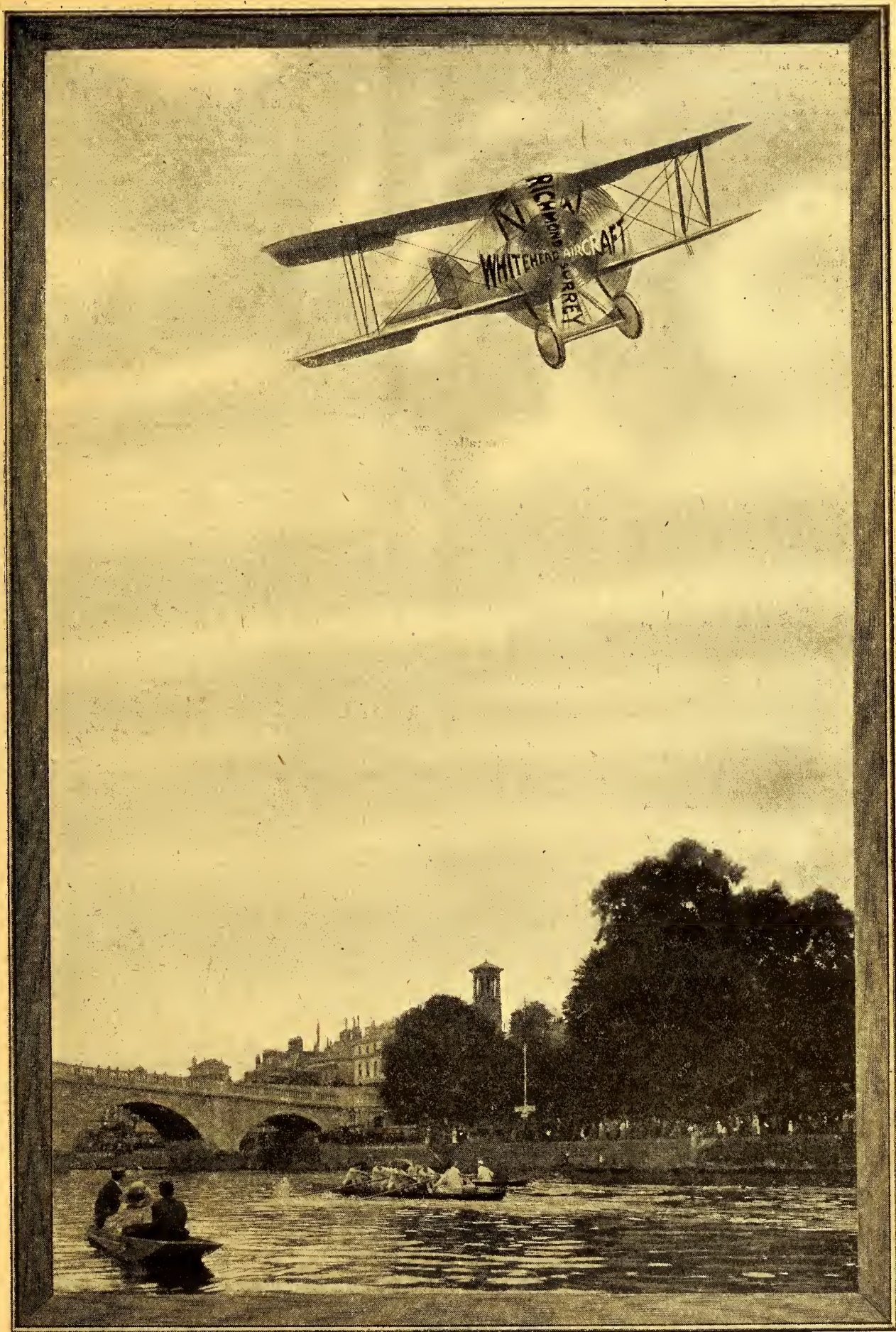
Messrs. H. D. Dall, C. E. Skinner, and W. O. Spinks, all entered as Warrant officers (2nd grade), for temp. service, seny. Nov. 18th, and appointed to "President," addl., for R.N.A.S.

* * *

ADMIRALTY COMMUNIQUÉS.

Nov. 15th.—During the early hours of this morning (15th inst.) the harbours and submarine shelters at Zeebrugge and Ostend were again heavily bombed by squadrons of naval aeroplanes and seaplanes.

Direct hits were observed in the Atelier de la Marine, and in close proximity to the power station.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

A large fire, probably emanating from a petrol store, was also observed.

All machines returned safely.

Nov. 17th.—A successful raid was made on Ostend and Zeebrugge this morning, the 17th inst., by British naval aeroplanes and seaplanes.

A considerable weight of bombs was dropped with good results on the docks and shipping.

All machines returned safely.

With reference to the raid reported in the French communiqué on Oct. 25th, when 11 British naval aeroplanes, accompanied by five French machines, bombed the Essingen Works at Hagendingen (north of Metz) a fuller report has now been received, from which it appears that considerable damage was done.

The objective consisted of blast furnaces and steel works, and was, therefore, of especial interest from a naval point of view, as the steel which is produced there is used in the construction of big guns.

According to the reports of the pilots, only two factory chimneys were left intact after the last bombs had been dropped, and, therefore, although it is possible that part of this factory may be in working order again shortly, the greater part of the works attacked will be out of action for some considerable time.

Nov. 20th.—On Nov. 18th British seaplanes and aeroplanes, operating against the Bulgarian coast, successfully bombarded Karjani, Pravishta, and Senultos.

PERSONAL NOTICES.

DEATH.

MALET.—Flt. Sub-Lt. F. A. Rivers Malet, R.N. (accidentally killed in the great operations in the air last week), belonged to families whose members have been long associated with the service of the Crown, including Sir Edward Malet, formerly Ambassador at Berlin, and Admiral Sir Reginald Bacon, commander of the famous Dover patrol. His father is Lt. H. Rivers Malet, R.N., and his mother is a daughter of the late Major King, Royal Scots Greys. He was born in India and educated in South Africa and King's School, Worcester. He entered the firm of Messrs. Green, ship engineers, and afterwards went to Cornwall for marine salvage work, and became a member of the Cornwall Fortress R.E. He went to British Columbia in 1913 for salvage work, and joined the Canadian Naval Forces, but on war breaking out he enlisted in the 48th Highlanders of Canada as a motor cyclist, and served in Lord Brooke's Brigade. Early this year he was transferred to the Navy owing to his knowledge of engines and motors, qualified as a pilot, and was sent to Dunkirk, where he had many successful fights and flights. Recently he dropped in the North Sea, and was rescued by a destroyer, and on another occasion he put to rout a big aeroplane which had greater speed and armament than his own. His brother is also a flight lieutenant. The funeral took place at Chatham yesterday with naval honours.

MARRIAGES.

FITZHERBERT—LOWNDES.—On Nov. 15th, Flt. Sub-Lt. Cecil H. FitzHerbert, R.N.A.S., youngest son of Mr. and Mrs. Henry Corry FitzHerbert, of Millbrook, Abbeyleix, Ireland, was married to Katharine (Kitty) Lowndes, eldest daughter of Mr. and Mrs. Walter Lowndes, of Broomfield, Hoylake, Cheshire, at St. Hildeburgh's Church, Hoylake.

MILLS—WHITTINGSTALL.—On Nov. 14th, Flt. Sub-Lt. Herbert F. Mills, R.N.A.S., was married to Ella Grace Whittingstall, at St. John's Church, Putney, by the Rev. Canon Thurston Rivington.

MILITARY.

G.H.Q. COMMUNIQUÉS

Nov. 15th, 10.3 p.m.—Yesterday our aeroplanes did much useful work. Last night they made successful bombing attacks on an enemy aerodrome and railway lines, stations, and rolling stock.

Nov. 16th, 9.25 p.m.—Yesterday our aeroplanes carried out several successful bombing raids. One hostile machine was driven down damaged.

Nov. 17th, 9.16 p.m.—Yesterday much successful work was accomplished by our aeroplanes. Two important junctions on the enemy's lines of communication were bombed, and railways, billets, and aerodromes were attacked with bombs and machine-gun fire both by night and day.

Enemy aircraft showed more enterprise than usual, with the result that three of his machines were brought down on our side of the line and two on his own side. At least five more were driven to ground in a damaged condition. Three of our machines are missing.

Nov. 18th, 10.50 p.m.—Yesterday there was much fighting in the air. In one protracted combat between five of our machines and eight of the enemy's, one hostile machine was destroyed and the rest dispersed. In another encounter seven hostile machines were driven down damaged. Three of our machines are missing.

* * *

WAR OFFICE COMMUNIQUÉS.

Nov. 13th.—The General Officer Commanding-in-Chief in Egypt reports:—Yesterday an enemy aeroplane flying very high dropped several bombs in and about Cairo, killing and wounding a number of civilians. No military damage was done and only one military casualty was incurred.

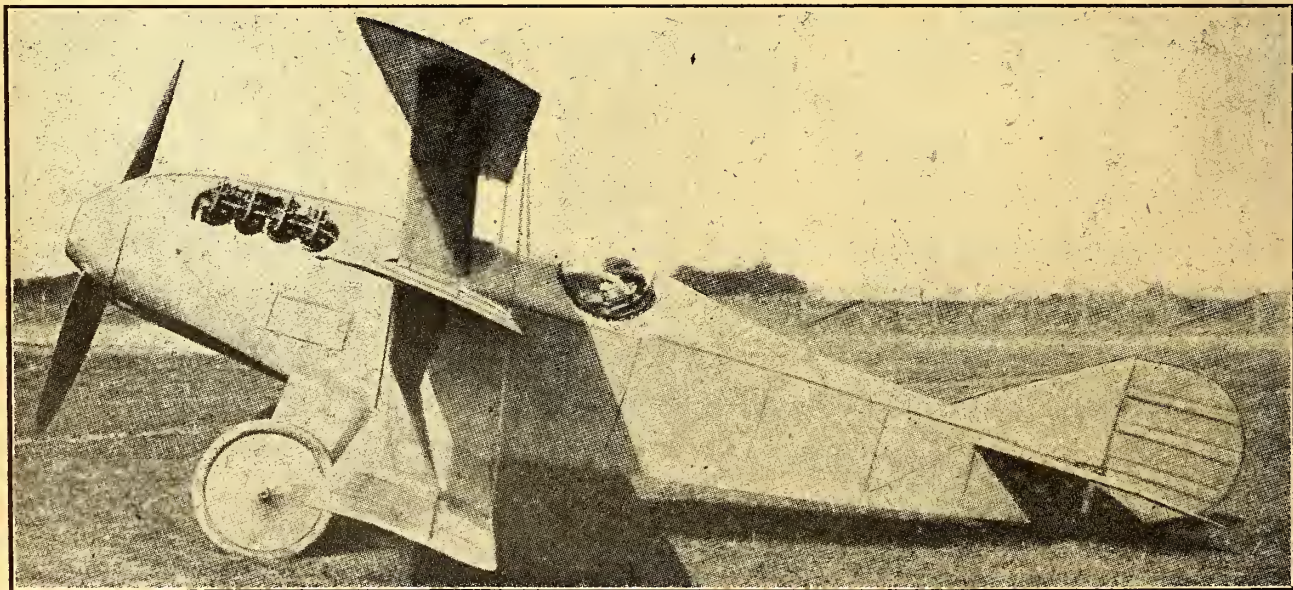
Nov. 15th.—The General Officer Commanding-in-Chief in Egypt reports that a further air attack was undertaken to Magh-daba (100 miles east of the Suez Canal at Ismailia) during the night of the 14th. The enemy was completely taken by surprise, and our machines, descending to a very low altitude, dropped 400 lb. of explosives on the camp and storehouses, causing considerable damage. Our machines have returned safely.

Nov. 16th.—The General Officer Commanding-in-Chief, Egypt, reports that aircraft successfully bombed Maghara, El Audja, and Kossaima on the 15th. All the machines returned in safety.

Nov. 18th.—The General Officer Commanding British Forces in Mesopotamia reports:—Euphrates Line.—On the 13th inst. British aeroplanes again attacked a hostile gathering near Al Ain (45 miles west of Nasiriyeh), nine bombs exploding in the enemy's camp.

Tigris Front.—On the 12th inst. an enemy aerodrome in the neighbourhood of Kut-el-Amara was bombarded, 16 bombs being dropped with good effect.

Nov. 18th.—The General Officer Commanding in Egypt reports:—A surprise attack by aircraft was made on the enemy camp at Masad (five miles west of El Arish and 85 miles east of the Suez Canal) on the morning of the 17th. Eight hundred pounds of explosive were accurately dropped on the tents with great effect. Our machines have all returned.



A side view of the 160-h.p. Curtiss Scout Triplane.

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No.		Source of Origin.
1.	Aviators' Belt Buckles (Registered designs and patents pending)	Paragon Works.
2.	Aviators' Leather Belts complete	Walsall
3.	Bolts, Hexagon	Birmingham and Willenhall.
4.	Cable Fasteners	" "
5.	Celluloid Clear Sheets	London.
6.	Crank Shaft Forgings	Brooklyn, N. York.
7.	Eyebolts to any pattern, rough and finished	U.S.A., Birmingham and Willenhall.
8.	Hinge Pins, Finished	Birmingham.
9.	Hinges of every description	Willenhall & Paragon Works.
10.	Lug Plates	Willenhall.
11.	Nuts, Hexagon, Slotted	Birmingham.
12.	Ribs pressed to any pattern	Paragon Works.
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14.	Seats, Aeroplane	Walsall.
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19.	Tapes, Egyptian and Indian	Sole Agencies Leicestershire, Derbyshire, Yorks.
20.	Tie Rods, rough or finished	Willenhall, Walsall.
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26.	Wiring Plates	Willenhall, Walsall.

The Secretary of State for India makes the following announcement on Nov. 18th:—On the 14th inst. the Government of India reported that large Mohmand forces, estimated at 6,000, were collecting on the border opposite Shabkadar.

Our troops engaged them on the 16th. The enemy were too scattered to offer a good target for guns. For the first time in Indian warfare aeroplanes were used and afforded great assistance.

Nov. 19th.—The General Officer Commanding British Forces in Greece reports:—Our aviators successfully bombed the enemy's camp north-east of Seres (on the railway leading to Constantinople).

* * *

The following supplementary official statement was issued in Cairo on Nov. 13th:—In revenge for the raid which was carried out by 12 of our aeroplanes at Beersheba and Maghdaba on Saturday last, when they seriously damaged some military establishments, which, naturally, were the sole objects of attack, one hostile machine this morning dropped nine bombs on the business and residential quarters of Cairo. The enemy thus adheres to the principle of directing attacks not on military targets, as prescribed by international law, but on dwellings and on the persons of the inoffensive civil population.

* * *

According to a report from Johannesburg, dated Nov. 16th, Capt. Miller, of the R.F.C., stated that between July 1st and the middle of October only 14 German machines flew over the British lines, five being brought down. In the same period between 4,000 and 5,000 Allied machines visited the enemy's territory.

[The statement seems a little difficult to believe.—Ed.]

THE CASUALTY LIST.

Reported Nov. 15th.

KILLED.—Jordan, Sec. Lt. W., R.F.C.
Lowe, Sec. Lt. H. G. P., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Faraday, Sec. Lt. M. S., R.F.A. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Whitty, Capt. J. L., M.C., Leinster Regt. and R.F.C.

Reported Nov. 16th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMAN HANDS.—Sanders, Lt. J. W., Middlesex R., attd. R.F.C.

CORRECTION.—Crawford, Sec. Lt. W. C., Machine Gun Corps and R.F.C. (reported wounded). should read:—Crawford, Sec. Lt. K., Machine Gun Corps and R.F.C.

Reported Nov. 17th.

DIED OF WOUNDS.—Patterson, Sec. Lt. A. A., Border Regt., attd. R.F.C.

WOUNDED.—Bell-Irving, Lt. A. D., Gordon Highrs, attd. R.F.C.

Brearley, Sec. Lt. N., M.C., Liverpool Regt., attd. R.F.C.

Hayes, Sec. Lt. T., R.F.C.

MISSING.—Bolton, Capt. A. C., M.C., Royal Scots Fusiliers, attd. R.F.C.

Cameron, Sec. Lt. J. G., Cameron Highrs., attd. R.F.C.

Curlewis, Sec. Lt. I., R.F.C.

Hallam, Sec. Lt. H. A., York and Lanc. Regt., attd. R.F.C.

Knight, Lt. G. F., Devon Regt., attd. R.F.C.

Mapplebeck, Capt. T., Liverpool Regt., attd. R.F.C.

KILLED.—R.F.C.—Banks, 10023 2nd Cl. Air Mech. J.

DIED.—R.F.C.—Reynolds, 20012 2nd Cl. Air Mech. R. F.

WOUNDED.—R.F.C.—Helingoe, 2924 Flt. Sgt. J.; Horsley, 9557 2nd Cl. Air Mech. W.

Reported Nov. 18th.

KILLED.—Bidmead, Sec. Lt. C. H., Shropshire L.I. and R.F.C.
Hynes, Sec. Lt. E. S. P., E. Kent Regt. and R.F.C.

WOUNDED.—Cowie, Sec. Lt. J. D., Argyll and Sutherland Highrs. and R.F.C.

Goolden, Lt. G. E., A.S.C. and R.F.C.

MISSING.—Allport, Sec. Lt. M., R.F.C.

Bennet, Lt. T. M., M.C., R. Irish Rifles, attd. R.F.C.

Evans, Sec. Lt. H. F., R.H.A. and R.F.C.

WOUNDED.—R.F.C.—Mann, 9755 2nd Cl. Air Mech. M. A.

MISSING.—R.F.C.—Snowdon, 24715 Sgt. P

Reported Nov. 20th.

KILLED.—Creery, Sec. Lt. C. J., R.F.C.

MacRae, Sec. Lt. C. E., Seaforth Highrs., attd. R.F.C.

DIED OF WOUNDS.—Allan, Sec. Lt. J., R.F.C.

WOUNDED.—Norman, Capt. G. H., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Miller, Sec. Lt. W. D., R.G.A. and R.F.C.

PREVIOUSLY UNOFFICIALLY, NOW OFFICIALLY REPORTED KILLED.—Monckton, Sec. Lt. C., Royal Irish Fusiliers, attd. R.F.C.

COLONIAL FORCES.—PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED AS A PRISONER OF WAR IN GERMAN HANDS.—Ormsby, Lt. J. A. N., Canadian M.G.B., attd. R.F.C.

KILLED.—R.F.C.—Thake, 5710 1st Air Mech. H. T. J.

Reported Nov. 21st.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Newton, Sec. Lt. H. J., Cheshire Regt., attd. R.F.C.

WOUNDED.—Allcock, Capt. W. T. L., R.F.C.

Short, Sec. Lt. H. C., R.F.C.

WOUNDED.—R.F.C.—Mann, 9755 2nd Cl. Air Mech. M.A. (Fulham).

MISSING.—R.F.C.—Snowdon, 24715 Sgt. P. (Hatton Rudley).

PERSONAL NOTICES.

DEATHS.

BENNET.—Lt. Trevor Mourtray Bennet, M.C., Royal Irish Rifles, attached R.F.C., missing, believed killed, was the son of Mr. James Bennet, Belfast. He obtained his commission two years ago. Quite recently he joined the R.F.C., and on the 10th inst. took part in a combat near British lines.

* * *

BYERS.—A verdict of accidental death was returned at an inquest on Nov. 16th at Boldre in the case of a young flying officer named Harry Elliott Byers. The evidence showed that the machine made a vertical dive from a height of 3,500 ft., and it was surmised that the deceased was seized with illness while in the air, as nothing broke while the machine was being flown.

* * *

CLARKE.—Sec. Lt. W. Michell Clarke, R.E., killed, was the younger son of Dr. and Mrs. J. Michell Clarke. Born in 1896, he was educated at Packwood Haugh and Oundle. He joined the ranks of the South Midland Royal Engineers in July of last year, and was given his commission in the October following. Sec. Lt. Clarke went to the front in September of this year. His elder brother is an officer in the R.F.C.

* * *

CREERY.—Sec. Lt. Cuthbert John Creery, R.F.C., killed, was the second son of Mr. Andrew McCreight Creery and of Mrs. Creery, of Vancouver. He was 21 years of age, and received his commission in Dec., 1915. He was gazetted Flying Officer in April last.

* * *

FWOLER.—At Montrose, on Nov. 16th, an aeroplane piloted by Lt. Fowler, R.F.C., collided with the chimney of a house and remained fast on the roof. The impact caused the petrol tank to catch fire, and before assistance could be rendered the pilot was dead, though whether death was due to burning or to the collision is not known.

* * *

HYNES.—Sec. Lt. Patrick Hynes, R.F.C., died on Nov. 10th, as the result of an accident while flying on duty. He was the youngest son of Mr. H. H. Hynes and the late Edith Hynes, of Penmorvan, Penzance. He was 18 years old.

* * *

JORDAN.—Sec. Lt. W. Jordan, of 16, Leazes Terrace, Newcastle, who has been killed at the front whilst flying, was a son of the late Mr. Charles Jordan, of the first of Jordan and Sons, engineers and ironfounders, Newport, Mon.

* * *

MACRAE.—Sec. Lt. Charles E. MacRae, Seaforth Highlanders, attached R.F.C., killed, was at the outbreak of war in the Seaforths. About a year ago he was promoted to Lt., and some months ago transferred to the R.F.C. He was the third son of the Rev. Donald MacRae, B.D., parish minister of Edderton, who is at present on service as a military chaplain, and has had three sons in the Army.

* * *

McKISACK.—The jury returned a verdict of accidental death at the inquest on Nov. 14th on the body of Sec. Lt. Lawrence Hill Wilson McKisack, attached R.F.C., whose death was recorded in the last week's AEROPLANE. He was 23 years of age.

Lt. K. C. MacCallum said the deceased officer was making his first solo flight. He flew one circuit in a normal manner, and on completing the second circuit put on too much bank and apparently not enough rudder, which caused the machine to side-slip, and it fell from about a height of 25 ft. The machine was a total wreck.

Medical evidence showed that death was instantaneous.

* * *

NEWTON.—Sec. Lt. Henry Joseph Newton, Cheshire Regt., attached R.F.C., was reported missing on Aug. 2nd, but news of his death on that date has now been received through the Red Cross at Geneva. He was the younger son of Mr. and Mrs. A. Newton, of 37, Netherhall Gardens, Hampstead, and was educated at University College School, where he was a monitor, a colour-sergeant in the O.T.C., and a member of the Bisley VIII and of the first XV. He held the challenge cup for boxing from 1908 till 1914. In July, 1914, he matriculated at London University, and on the outbreak of war he immediately offered his services. After serving as sergeant in the 12th London Regiment, he was gazetted second lieutenant in that battalion in Sept., 1914, and went to the front on Christmas Day. In the following February he received his second star. He was wounded at Ypres in May, and soon after his convalescence resigned his commission and

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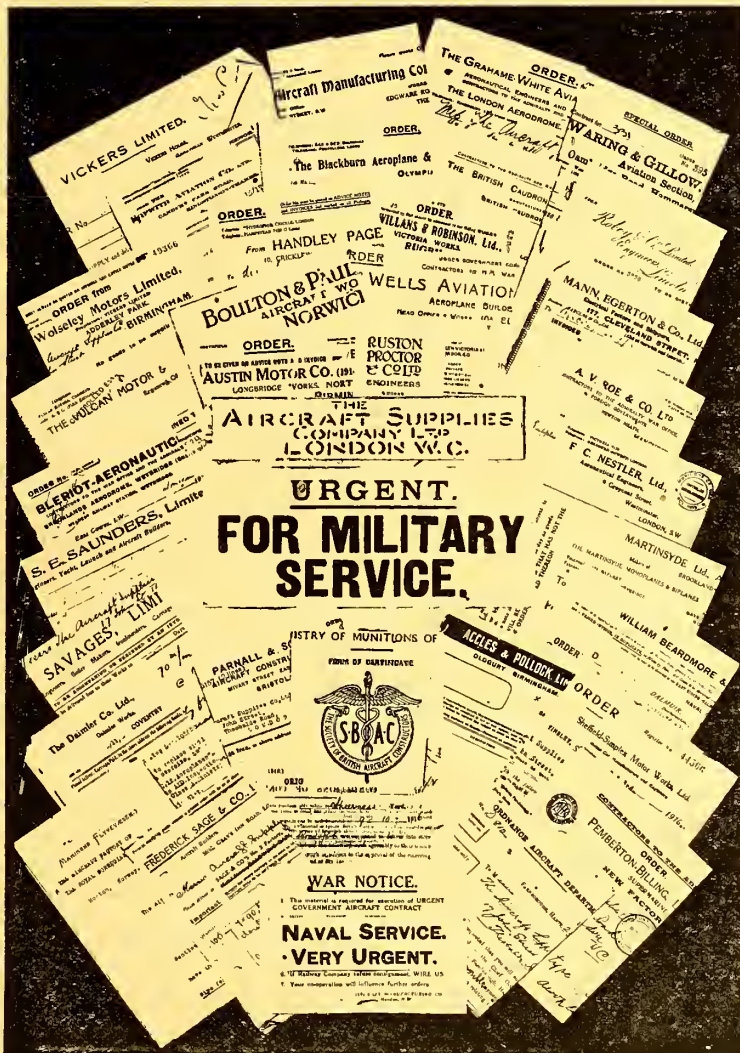
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went to Sandhurst, where he became a sergeant. In November he was appointed a second lieutenant in the Cheshire Regiment, and was attached to the R.F.C., going to the front as an observer in May, 1916. He would have reached his 20th birthday on Aug. 6th.

* * *

NIVEN.—Sec. Lt. W. A. M. Niven, R.F.C., was the eldest son of Mr. A. Y. Niven, of Johannesburg, and grandson of the late Mr. A. M. Niven, of Glasgow. When war broke out he enlisted in the Transvaal Scottish, and went through the German South-West African Campaign under General Botha. Early this year he came to England, and, obtaining a commission in the R.F.C., served at the front until Oct. 28th, when he was killed. His commanding officer writes:—"Though not long with us, he had become a great favourite, and died like a true Englishman."

* * *

PATTERSON.—Sec. Lt. Aubrey F. A. Patterson, R.F.C., who has died of wounds, was born in 1895, and was the youngest son of Mr. and Mrs. W. R. Patterson, of Cleveland Square, Hyde Park. Educated at Berkhamsted and Eastbourne College, he distinguished himself as an athlete, and won the swimming championship at Eastbourne when he was 16. Within a few days of the commencement of the war he enlisted in the H.A.C., and went out to France at the end of 1914. Returning invalided to England in 1915, he was appointed to a commission in the West Yorkshire Regt., and was subsequently attached to the R.F.C. He went back to the front this year, and became actively engaged in bombing operations, in which he did "excellent work." Sec. Lt. Patterson was brought down on Sept. 17th by a numerous German squadron, and died of his wounds at Osnabruck.

* * *

WELSFORD.—Sec. Lt. George Keith Welsford, R.F.C., was the eldest son of Mr. and Mrs. J. H. Welsford, of 6, Carlton Gardens, and Mansfield House, Iver Heath, Bucks. He was educated at Bilton Grange and at Harrow. He was a keen member of the Harrow O.T.C., and was the champion lightweight boxer and a school swimmer. At the outbreak of war he was sugar planting in Demerara. He returned home and enlisted in the R.E. as a dispatch rider. He went to the front in June, 1915, was gazetted a Sec. Lt. in the R.F.C. in June, 1916, and was posted a fully qualified observer a few weeks ago. He was killed on Oct. 20th, aged 25.

* * *

MARRIAGE.

BELL—SLOAN.—On Nov. 15th a wedding took place between Sec. Lt. Charles H. Bell, of the R.F.C., and Miss Daisy Sloan at Hendon Parish Church. Many aviators attended the wedding. Mr. Bell was formerly an instructor at Hendon Aerodrome, and is home on leave from France.

* * *

BIRTH.

BECKE.—At Dudley Villas, Witton, Droitwich, on Sept. 24th, the wife of Lieut.-Col. J. H. W. Becke, Sherwood Foresters and Royal Flying Corps, of a son.

* * *

Mr. and Mrs. A. R. Watts, of Elm Street, Westfield, N.J., U.S.A., have received word that their son Ruskin, aged 20 years, a member of the R.F.C., has been missing since Sept. 22nd. It is not known by the British Government, who notified the parents, whether their son has been captured. Mr. Watts joined the R.F.C. in Canada, and in March last obtained a pilot's certificate from the New York Aero Club. He sailed for Liverpool on April 19th.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Nov. 16th.—Yesterday one of our pilots brought down an enemy machine near Chaulnes.

Nov. 17th.—Capt.-Aviateur de Beauchamp ascended at 8 o'clock this morning for a flight to Munich.

Arriving about noon over that town, he dropped several bombs on the station as a reprisal for the bombardments of the open town of Amiens carried out by the Germans within the last few days.

He afterwards landed at Santa Dona di Piave, in Italy, 20 kilometres (12½ miles) north of Venice, after crossing the Alps. He thus covered a distance of 700 kilometres (437½ miles).

Our guns forced two aeroplanes to come down in our lines—one the day before yesterday south of Attichy (east of Compiègne), and the other yesterday near Roye-en-Matz (south of Roye). The aviators were taken prisoners.

Yesterday our aircraft in the region of Amiens fought 54 fights, in the course of which Lt. Heurteaux brought down his 13th machine and Sous-Lt. Guynemer his 21st.

During the night several bombardments were carried out, notably against the railway station and works of Esch-sur-Alzette (Luxemburg) and the aviation part of Tergnier (north-east of Chauny). Over 1,500 kilogrammes (more than a ton and a half) of bombs were dropped.

Nov. 18th.—On the 16th inst. one of our machines, carrying Sous-Lt. Pilot Loste and Qmtr. Mach.-Gnr. Vitalis brought down on the Somme front a German aeroplane. This is the fifth machine brought down so far by these two aviators.

On the 17th, two German aeroplanes were brought down by our pilots. One of these fell in flames near Hallu (south of Chaulnes), the other was destroyed by Adjudant Tarascon, who thus gained his eighth victory, and fell near Manancourt (east of Saillisel). Two other German machines were brought down in aerial duels north of Fouquescourt, south-west of Vouziers, after a lively engagement. One of our pilots used his machine-gun at very close quarters upon a German machine, one of whose wings became detached and the machine crashed to earth in the region of Marvaux (south of Vouziers). Finally, a sixth enemy aeroplane, attacked by one of ours, fell in flames in the region of Viéville-en-Haye (north-west of Pont-à-Mousson).

Nov. 19th.—Last night one of our air squadrons dropped 157 bombs on the enemy aerodromes at Golancourt (Oise), and Grisolles (north of Château-Thierry).

It is confirmed that on Nov. 16th Adjudant Dorme brought down his 16th German aeroplane. The German machine fell near Marchdepot (east of Pressoir).

ARMY OF THE ORIENT.—British aircraft bombarded enemy camps near Seres, and our aircraft dropped bombs on bivouacs and camps at Novak and Monastir.

* * *

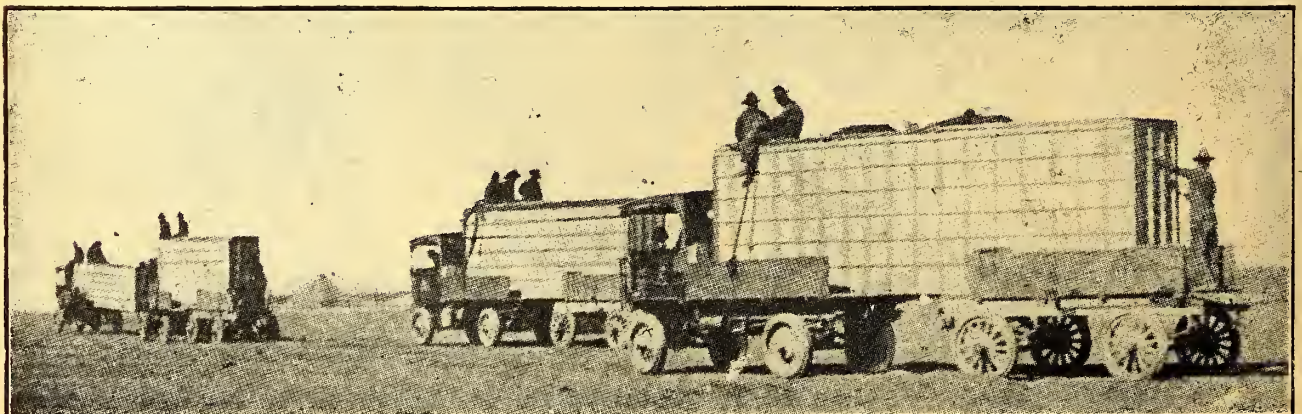
The Paris 'Journal' says that a younger brother of the well-known French aviator Navarre, himself a pilot, fell while experimenting with a new machine and was killed.

* * *

Graphic details of the French air raid on Essen on Sept. 24th, when Capt. de Beauchamp and Lt. Dacourt dropped twelve bombs on Krupp's, are published by the "Herald."

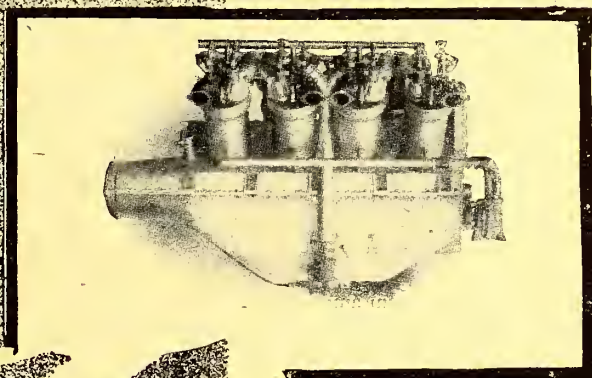
At a quarter past eleven a.m. Capt. de Beauchamp set his motor going and took the air. No one except Lt. Dacourt knew where he was going. Even the workmen who constructed the machines must have been surprised when they read the communiqué announcing the raid on Essen, for they thought they were preparing an expedition on Ludwigshafen.

The aviators followed the Moselle, arrived over Trèves, left Coblenz on the right and avoided the large towns, where their



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passage might have been signalled. The Rhine was crossed a little north of Romagen.

Essen was reached at two o'clock in the afternoon. The atmosphere was absolutely clear. At 5,000 yards' altitude, still keeping company, the two aviators followed from east to west the principal street of the town, clearly defined as on a map. Captain de Beauchamp went ahead, and first entered the Krupp heavens. On all hands rose a forest of chimney stacks, sheds, workshops, and furnaces.

One by one the six bombs were dropped by the captain, and he could see the sharp, short flames and the sparks of the explosions. Without any hurry, he circled for a moment, while his comrade in turn dropped his projectiles. From one of the workshops a great cloud of blue smoke arose. Not a single shot had been fired at the aeroplanes. The return journey was made by way of Liège.

"I had another two hours' petrol supply when I arrived," said Captain de Beauchamp, "and could have gone farther."

[It is reported that both Capt. de Beauchamp and Lt. Daucourt used Sopwith "1½ strutters" in this raid, and that Capt. de Beauchamp used the same machine in the subsequent raid on Munich. —Ed.]

* * *

The "Morning Post" correspondent in Paris wired on Nov. 19th:—

The official statement that Capt. de Beauchamp, leaving France at Nancy at eight o'clock on Friday morning, succeeded in dropping bombs on Munich at midday and in landing safely on Italian soil has caused great enthusiasm among aviators here. The captain was one of those who bombarded the Krupp works at Essen last September, travelling 500 miles in the course of his expedition. On the present occasion he was alone.

Capt. de Beauchamp was born at Senlis in 1887, and has had his certificate as a pilot from the Aéro Club de France since 1912. At the outset of the war he was a Sous-Lieutenant Aviateur, and at present he is in command of a squadron in the East. He has been mentioned on several occasions in Army orders, and was recently awarded a gold medal by the Aéro Club de France for his bombardment work. He prefers solitary flights, and his latest exploit has aroused the keenest enthusiasm among those who realise the difficulties attendant on the passage across the centre of the Austro-Swiss Alps.

* * *

The "Times" correspondent at Vicenza wired on Nov. 19th:—

The particulars now available of one of the greatest flights in the history of aviation are to the effect that the aviator left the Haute Marne at 7.30 a.m. on a machine of the Nieuport model in unfavourable weather conditions. His route lay over Colmar and the Black Forest. He kept at a great height, and eluded the vigilance of the enemy. The air currents were icy, and at moments the enterprise seemed desperate.

Munich was reached at midday, and the aviator swooped down on the railway station, on which he let fall six bombs from a height of a few hundred feet. He states that the effects of the explosions were quite visible. Rising swiftly again, he flew south-east, following the valley of the Inn to Innsbruck. Reaching the Lower Piave, he mistook it for the beginning of the Venetian lagoons, and at 2.45 landed in a field near San Dona di Piave.

The aeroplane remained in perfect condition during the entire flight, but the motor and propeller were slightly damaged in the act of landing. Capt. de Beauchamp maintained a speed of slightly over 60 miles an hour for the 437½ miles covered, and reached a height of between 12,000 and 13,000 ft. The velocity of the wind currents varied from 16 ft. per minute at 3,300 ft. to 72 ft. per minute at 10,000 ft.

A telegram from Munich to the "Cologne Gazette" says:—

On the occasion of the raid by the French aviator, Capt. de Beauchamp, on Friday last, one bomb fell in the garden of the Basilica, adjoining the Karlstrasse. All tram traffic was stopped from 1.30 p.m. to 3 p.m. Another bomb fell in the garden of Schwanthalerstrasse, but did not explode.

The "Cologne Gazette" pays a tribute to the skill of Capt. de Beauchamp's remarkable flight.

* * *

Two fresh names have been added to the list of French aviators who have succeeded in bringing down more than five enemy machines, those of Sub-Lt. Loste and Qmtr. Mach.-Gnr. Vitalis.

Qmtr. Vitalis at the beginning of the war was rejected for service on medical grounds, but insisted on being allowed to serve, and after many difficulties was accepted in January last. In civil life he was a champion shot, and, after practising shooting in the air, he was sent to the front on Air Service. The first machine he brought down was defeated after he had had only seven hours' continuous flying, and shortly after he appealed to be appointed to one of the large fighting planes that carry a crew of three. In this capacity he has had a brilliant career.

Sub-Lt. Loste has also been only a short time in getting his fifth aeroplane. His first victory was on July 28th. He has had several very narrow escapes, and on Nov. 1st his machine was turned over in a storm and he fell to within a hundred and fifty yards of the ground just over a German aerodrome. He managed to right it, and was at once pursued by a German aeroplane, which he shot down.

GERMANY.

OFFICIAL COMMUNIQUÉS.

Nov. 14th.—During the month of October our flying corps, with great success, has splendidly carried out its heavy and manifold duties on the Western front. Special recognition and thanks are due to the aviators engaged in artillery and infantry observation. Their effective protection was assured by the battle aviators, who also splendidly carried out their special tasks, and by the fire from our anti-aircraft guns.

We lost 17 aeroplanes, while our enemies in the West, the East, and in the Balkans lost 104 aeroplanes. Of these 83 were lost in aerial fights, 15 by being hit by anti-aircraft guns, and 6 by forced landings behind our lines. 60 enemy aeroplanes are in our possession. On the other side of the line 44 can be seen which have fallen to earth.

Nov. 15th.—There is no change in the situation.

Bombs have been dropped by our aviators on the fortress of Bukarest.

Nov. 17th.—During the morning of Nov. 15th enemy aeroplanes dropped bombs on the ports of Zeebrugge and Ostend.

Vessels and naval works were not damaged. Thirty-nine Belgians were killed at Ostend.

Nov. 19th.—Last Thursday night German naval aeroplanes dropped a number of bombs mostly of heavy weight, and of a total weight of over 1,400 kilogrammes (about a ton and a-half), with successful results on the town of Furnes (south of Nieuport) and on the flying ground at Coxyde (north of Furnes). At Furnes several conflagrations were observed. One aeroplane, by machine-gun fire, rendered two searchlights unworkable near Coxyde.

* * *

An official telegram from Berlin on Nov. 16th states that the increasing importance of aerial warfare has made it necessary to combine under one board the entire aerial and anti-aircraft forces of the Army in the field and at home.

The uniform development and preparedness of these services have been entrusted to the General in command of the aerial forces. Lt.-Gen. von Höppner, who up to now has been in command of a reserve division, has been appointed General in command of the aerial forces.

RUSSIA.

A News Agency report from Petrograd dated Nov. 19th says:—

On the south-west front, near Sarny, the Russians have brought down a large Zeppelin. They captured the crew of sixteen, three guns, two machine guns, and nearly 300 kilogrammes (six cwt.) of bombs.

[The "Zeppelin" appears to have been either a Parseval or a Schütte-Lanz.—Ed.]

ITALY.

OFFICIAL COMMUNIQUÉS.

Nov. 14th.—Hostile aircraft attempted to make raids over our territory with great persistence but were driven off by the fire of our anti-aircraft batteries and aeroplane attacks.

In the Upper Vanoi valley an enemy squadron succeeded in dropping bombs on Canale San Bovo, killing two soldiers and some animals.

On the evening of the 12th enemy seaplanes dropped bombs on Ravenna, Pont Lagoscuro, Polesella Magnavacca, and Ariano Polesine (at the mouth of the Po). There were no casualties or damage. Air raids on Romans, Vermeigliano, and Doberdo (Lower Isonzo) yesterday were equally fruitless. An enemy aeroplane attempted to attack one of our observation balloons but was hit by our artillery and fell in over the enemy's lines near Nabresina (Gulf of Trieste).

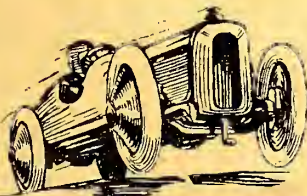
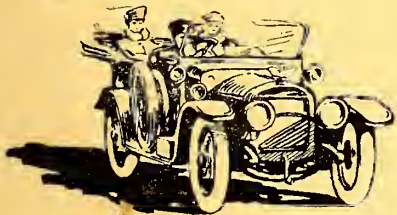
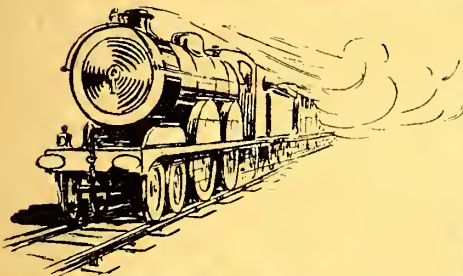
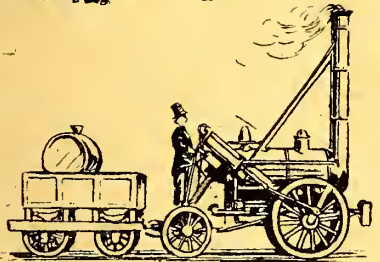
Nov. 15th.—During the night of Nov. 14-15th enemy seaplanes dropped bombs round Aquileia, killing two soldiers and wounding four women and children. After this Italian aircraft promptly attacked the floating airsheds of the aggressors at Prosecco and on the pier at Trieste, both of which were bombarded with marked success.

Enemy aeroplanes were active in the Gorizia area, but no damage was done by their bombs.

Nov. 16th.—On the Carnia front enemy aircraft dropped bombs on Stazione Carnia without causing harm, and on Moggiò Udinese (Fella Valley), killing two women and wounding three.

Enemy aeroplanes dropped bombs in the Vallone (Carso) without doing damage.

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VICTORIA, LONDON.

The Pope has sent an energetic protest to Austria regarding the bombardment of Padua, recalling his former pronouncements against such a brutal system of warfare, which has no military purpose and only causes suffering to the innocent and unarmed civil population.

* * *

Universal indignation seems to have been aroused in Italy at the news of the bombardment by Austrian aviators of Padua. Sixty deaths have been caused by one bomb which fell on a shed where a crowd of women and children had fled in search of refuge.

This is apparently Austrian retaliation for the recent Italian victory on the Carso. The incursion on Padua took place on Saturday night, and would not have had this disastrous result had it not been for the unfortunate circumstance that the subterranean refuge purposely set aside for shelter against aeroplane bombs was flooded owing to the recent rains, and the crowd which had flocked to it was unable to enter, and was caught huddled together in a narrow passage.

* * *

The "Ordine" learns from an Austrian source that recent exploits by Italian dirigibles have given rise to anxious fears among the people of the Austrian capital.

It is recognised that the Italian dirigibles are fully capable of making raids on Vienna, and they are regarded as more dangerous than Zeppelins, on account of their extraordinary speed and their power of flying at a great height.

It is believed that this fear of raids against Vienna is responsible for the cessation of Austrian aeroplane raids against Venice and Milan.

[It seems more likely that bad weather was responsible.—Ed.]

* * *

It is reported that Lt. Guido Guidi, of the Italian Army, has put the Italian altitude record up to 7,950 mètres, or nearly 25,000 feet, which beats everything except the world's altitude record put up by Herr Oelerich in Germany before the war, when he reached an altitude of 25,750 feet.

The machine on which Guidi's record was made was a twin-engined National biplane, and the flight was made in extremely cold weather. The newspapers advertise that the record was made with a Feroldi carburettor, which I mentioned some weeks ago as having so vastly improved aircraft and other engines.—T. S. H.

ROUMANIA.

OFFICIAL COMMUNIQUÉS.

Nov. 14th.—During the past fortnight Bukarest was protected against aerial attack by the heavy weather. This morning, however, the sky having cleared, several enemy aeroplanes appeared over the city, dropping bombs. They were vigorously attacked by the anti-aircraft artillery and soon disappeared.

Nov. 15th.—During the last two or three days the enemy has again displayed particular activity. Enemy machines have flown over Turnu-Magurele, Simnizta, the region of Giurgevo, Tulcha, Campulung, Sinaia, and Roman, and dropped bombs, causing slight damage.

They dropped bombs on the capital and its environs, killing and wounding peaceable inhabitants, especially women and children. On this occasion they dropped a great number of bombs over the Palace where the Queen and the Princesses of Roumania were formerly living. Fortunately they had left after the death of Prince Mircea.

On various occasions, and especially yesterday, enemy aviators flew over small towns and villages, descending very low with their machines, and fired with machine-guns on the peaceable population in the streets or who were working in the fields.

Nov. 18th.—A recent German communiqué claims that the Roumanian civil population is participating in hostilities. We offer a most energetic and formal contradiction to this assertion. The civil population has nowhere participated in the fighting.

The evident purpose of this German statement is to justify the massacres which they intend to carry out in Roumania, just as they did in Serbia and Belgium, and which as a matter of fact they have already carried out with indescribable cruelty in the invaded villages. Those whose aeroplanes are assassinating women and children in Bukarest need not go to the trouble of inventing such pretexts.

* * *

The reports that the Bulgarians have dropped poisoned articles, including sweets and toys, from aeroplanes are corroborated by Miss Helen Monfries, who has just returned to London from the Dobruja.

Miss Monfries, who was chauffeur and interpreter with the Scottish Women's Hospital, took part in the retreat of the Roumanian Army in the Dobruja, and had thrilling experiences.

"At Constanza," said Miss Monfries to a "Daily Express" representative yesterday, "Bulgarian aviators in German aeroplanes bombarded the place twice daily in broad daylight. The fumes of their bombs were intended to spread:—

Typhoid
Scarlet Fever

Enteric
Cholera.

"I myself had a narrow escape from two ordinary explosive bombs. The enemy also set fire to petrol tanks belonging to the American Standard Oil Company. Another favourite device was to drop gilded pencil-cases which exploded when the band containing the pencil was moved, poisoned sweets, and poisoned toys in bags. In the last case the poison was contained in the reins of a toy horse. Several children were victims to these poison devices."

[One would like much more confirmation of this, as it hardly seems worth while to evolve all these trivial forms of frightfulness. One merely asks, Did Miss Monfries see them herself, or is she merely repeating yarns?—Ed]

TURKEY.

OFFICIAL COMMUNIQUÉ.

Nov. 13th.—On the morning of the 11th four enemy aeroplanes dropped some bombs on Beersheba without causing any damage and only injuring two workmen. The machines were pursued by ours.

EGYPT.

A revised list of casualties sustained during the air raid on Cairo on Nov. 13th is officially issued. It states that 14 persons, of whom 4 were Europeans, were killed, and 25, of whom 4 were Europeans, were injured.

U.S.A.

The following bids have been received by the Army Signal Corps for standard type tractor biplanes. The invitation for tenders from manufacturers was notified in THE AEROPLANE of Sept. 6th last:—

The Pattern Aeroplane Co., Detroit, Mich.:			
Lots of	Without Motors	Lots of	Without Motors
6	\$5,000.00 each	12	\$3,500.00 each
9	4,250.00 each	18	2,750.00 each
The New York Aero Construction Co., New York City:			
Lots of	With Motors	Lots of	Without Motors
6	\$9,250.00 each	6	\$6,550.00 each
9	9,125.00 each	9	6,425.00 each
12	8,975.00 each	12	6,275.00 each
18	8,800.00 each	18	6,100.00 each
Aeromarine Eng. & Sales Company, New York City:			
Lots of	With Motors	Lots of	Without Motors
6	\$9,000.00 each	6	\$5,620.00 each
9	8,750.00 each	9	5,370.00 each
12	8,500.00 each	12	5,120.00 each
18	8,250.00 each	18	5,000.00 each
The Curtiss Aeroplane Company, Buffalo, N.Y.:			
Lots of	With Motors	Lots of	With Motors
6	\$8,500.00 each	12	\$8,000.00 each
9	8,250.00 each	18	8,000.00 each
The Eastern Aeroplane Co., Brooklyn, N.Y.:			
Lots of	With Motors	Lots of	Without Motors
6	\$7,400.00 each	6	\$4,900.00 each
9	7,300.00 each	9	4,800.00 each
12	7,200.00 each	12	4,700.00 each
18	7,000.00 each	18	4,500.00 each
The Heinrich Aeroplane Company, New York City:			
Lots of	Without Motors	Lots of	Without Motors
6	\$4,500.00 each	12	\$4,350.00 each
9	4,400.00 each	18	4,300.00 each
Standard Aero Corporation of N.Y., Plainfield, N.J.:			
Lots of	With Motors	Lots of	Without Motors
6	\$8,850.00 each	6	\$5,800.00 each
9	8,700.00 each	9	5,700.00 each
12	8,650.00 each	12	5,600.00 each
18	8,550.00 each	18	5,500.00 each
Thomas Brothers Aeroplane Co., Ithaca, N.Y.:			
Lots of	With Motors	Lots of	Without Motors
6	\$8,200.00 each	6	\$5,400.00 each
9	8,100.00 each	9	5,300.00 each
12	8,000.00 each	12	5,200.00 each
18	7,900.00 each	18	5,100.00 each
Sturtevant Aeroplane Co., Boston, Mass.:			
Lots of	With Motors	Lots of	With Motors
6	\$9,650.00 each	12	\$9,500.00 each
9	9,650.00 each	18	9,500.00 each
Wittmann Aircraft Co., New York City:			
Lots of	With Motors	Lots of	Without Motors
6	\$8,000.00 each	6	\$5,000.00 each
9	7,750.00 each	9	4,750.00 each
12	7,500.00 each	12	4,500.00 each
18	7,350.00 each	18	4,350.00 each
The Pacific Aero Products Company, Seattle, Washington:			
Lots of	With Motors	Lots of	Without Motors
6	\$8,100.00 each	6	\$5,100.00 each
9	7,900.00 each	9	4,940.00 each
12	7,750.00 each	12	4,790.00 each
18	7,625.00 each	18	4,675.00 each

Considerable variation is noticeable between the different bids.

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and the prices are very interesting compared with British prices. Tenders are now invited for twin-motored fighting aeroplanes in quantities of 6, 12, 24, 48 and 96.

It is reported from Washington (Nov. 2nd) that Antony H. Jannus, the famous Washington aviator, was killed in Russia on Oct. 12th. Mr. Jannus was 27 years old. He made a 2,000-mile trip in a hydro-aeroplane down the Mississippi River in 1912.

No details of Mr. Jannus's death were contained in a cablegram to the Baltimore representative of the Curtiss Aeroplane Company. Roger Jannus returned to America about two months ago and is now at Buffalo.

It is reported that Miss Ruth Bancroft Law has flown on a Curtiss biplane from Chicago to Governor's Island, New York, a distance of 896 miles, in 8 hours 59 minutes. This equals the American long distance record, and is a new world's record for a woman.

Another report says she flew 590 miles in 341 minutes. Both accounts seem inaccurate.

ANTI-AIRCRAFT CORPS.

Dr. Macnamara states that the Anti-Aircraft Corps is being brought into line with all other branches of His Majesty's service according to the terms of the Military Service Acts. All men of military age are being medically examined, and as the number of men in the corps exceeds the number required, men will be given their discharges in accordance with their medical classification, commencing with Class A. The amount of duty performed by the men over military age who are Volunteers will remain as in the past, but the hours may be slightly adjusted. The Director of Recruiting has been requested to allow men who have been in the Anti-Aircraft Corps to join the artillery if they prefer.

According to the "Daily Chronicle" suggestions recently made by local authorities that there is danger, during Zeppelin raids, from tramways and railways, have been replied to by the Field-Marshal Commanding-in-Chief of the Home Forces, who points out that it is confidently believed it is only necessary to assure the public that the continuance of railway and tramway traffic does not serve as a guide to hostile aircraft, and is of vital importance for the successful prosecution of the war, for them to accept the decision and co-operate in carrying it out with loyalty and patriotism.

THE COMMAND OF THE AIR.

Col. Wilfrid Ashley, M.P., President of the Parliamentary Air Committee delivered an interesting address on the "Command of the Air" to a meeting of the members of the 1900 Club on Wednesday evening, Nov. 15th. Viscount Peel presided, and several distinguished visitors from the Overseas Dominions were present. Colonel Ashley reviewed the development of British aviation during the past five years from the point of view of national defence, and paid a warm tribute to the splendid achievements of the officers and men of the Royal Naval Air Service and the Royal Flying Corps.

He explained in convincing terms the absolute need of the moment for closer co-ordination between the Naval and Military branches of the Air Service, and showed how intensely important it was in the vigorous prosecution of the war to secure unified control in all matters relating to design of machines, contracts, stores and the supply of material. He appealed for the full and unqualified support of the country for the Air Board under the presidency of Earl Curzon, and said that until large executive powers were conferred upon the Air Board by the Government, aircraft as an essential part of our war organisation could not achieve its highest point of efficiency.

He expressed his deep regret that difficulties had been placed in the way of a great unified Air Service by the Board of Admiralty, and he sincerely hoped that the Prime Minister and First Lord of the Admiralty would realise the importance of a full recognition of the functions of the Air Board by the Board of Admiralty at the earliest moment.

He was satisfied that the Air Board should include a Representative of the Ministry of Munitions, and he was confident that a Board thus composed of officers from the Navy, Army and Munitions Departments under a powerful and capable Minister like Lord Curzon would ultimately achieve the command of the air.

He added that in the view of the Parliamentary Air Committee it would be entirely to the advantage of the Royal Naval Air Service if an Air Lord were added to the Board of Admiralty.

An interesting discussion followed. It was decided to issue a short pamphlet embodying the substance of Colonel Ashley's discourse.

THE ROYAL AERO CLUB.

NEW MEMBERS.—In accordance with the rules, the Annual Subscription of any new member who is elected between November 1st and December 31st of this year will cover the period up to December 31st, 1917.

SUSPENSION OF ENTRANCE FEES OF NEW SERVICE MEMBERS.—Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependents of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to November 7th, 1916	10,887	0	5
Collected at the Westland Aircraft Works, Yeovil (Fifty-fifth contribution)	0	13	7
Collected at the Westland Aircraft Works, Yeovil (Fifty-sixth contribution)	0	15	1
Staff and Workers of Gwynnes, Ltd. (Twenty-seventh contribution)	8	13	3
Total, November 14th, 1916	£10,897	2	4



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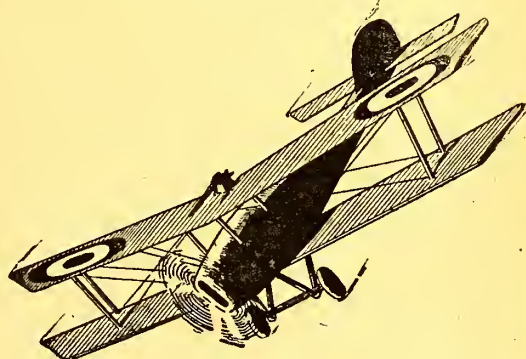
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PREPARING FOR PEACE.

It has become a trite saying that we are as unprepared for peace as in August, 1914, we were unprepared for war. However true this may be of other trades, we who are concerned with the aeroplane industry should, at any rate, take time by the forelock and make our due preparations. We have this special difficulty: that whereas other trades can profit by the lessons of the past, and have previous experience and precedent to go upon, we have little history to refer to. We can, however, adopt a definite policy now, and when Peace is declared prosecute it with all our energy.

Many aeroplane manufacturers are so busily engaged on war work that they have little time to consider what will be the position of affairs in the industry immediately after the war.

He would be a brave man, indeed, who would pose as a prophet as to the future of the Aeroplane Industry, and as a mentor to the very efficient manufacturers engaged therein as to the way they should set their houses in order in readiness for the complete change in business conditions after the war. That is why I have not signed this article—my idea being to stimulate the mental energies of much abler men than myself rather than to dictate or even to suggest to them as to the methods by which the Industry should be properly organised.

In this connection it is well to consider what was the position in the early days of the Cycle and Motor Industries, and apply the lessons of those days to the aeroplane industry. In many ways the conditions were similar. The experimental stage of the cycle and of the motor was the most boomed and the best advertised.

It attracted the fortune-hunter, the inventor, and the creator of wild-cat schemes, and the public, stimulated by the journalistic booming of these new industries, subscribed their capital readily to any new proposition. As it was quite impossible for them to obtain any reliable data as to the profit-earning capacities of the new undertaking (there were, in the nature of things, no past results to base them on), they had to give more than due credence to the profit forecasts in the prospectuses.

The inevitable result was that small businesses were floated with large capital, and although they found themselves in the early days quite equal to making a fair profit on their capital, when competition became keener and the supply began to catch up with the demand, these firms, with their inflated capital, soon went to the wall, and reorganisation and reconstructions became common among them.

If the Aeroplane Industry is not to be crippled in a similar way, it behoves those who are interested in its sound establishment in this country carefully to consider this matter of capital and finance now. Not so much to decide as to how the largest capital can be obtained from the public, but on how small an amount they can satisfactorily develop their ideas. The aim should be to pay the maximum dividend on the minimum amount of capital rather than to get the maximum amount of capital quite regardless of the capacity of the business to pay dividends thereon.

The next problem which will present difficulty will be the question of staff. To take first the office staff. It is fairly common knowledge that the offices of most aeroplane manufactories are being run on expensive lines. In most cases, there are too many assistants, very few of whom have their time fully occupied, the reason being that no one in authority has yet had the time or the inclination to organise their work economically. In many firms elaborate systems of filing have been adopted, and every effort has been made to obtain the most modern office appliances. But even in such cases a good deal of over-lapping occurs which could be eliminated by a little careful thought. I have often wondered why we do not have system specialists—something analogous to a physician—who would prescribe a system for a business without being financially interested in the sale of the appliances.

CAPITAL AND LABOUR.

The question of the Works staff is an even more difficult matter. Many of our best business brains have endeavoured to reconcile the interests of Labour and Capital, in spite of which the position to-day leaves very much to be desired. Co-partnership and profit-sharing schemes have been tried in many different forms.

All sorts of social organisations have been established to bridge the gulf which divides the employer and the employed. One of the mistakes has been that the employer has made the making of a fortune his aim rather than the establishment of a sound manufacturing organisation.

As to the comparative value of the two aims, no one who has ever had the excitement of overcoming the initial difficulties in building up a business against great obstacles can have any doubt. To the man who intends to make a fortune, the idea of retiring is his notion of paradise. But the man who has the establishment of a successful business at heart knows the importance of a contented staff living under healthy conditions and having an avowed interest in turning out articles which will worthily maintain the firm's reputation.

ENCOURAGEMENT TO WORKERS.

The ruling principle in the organisation of staff has been rather to turn the individual man into a machine by repressing his individuality, surrounding him with rules and regulations, and thus

obtaining a certain unit of labour values which can be expressed in numbers. In other words, to measure what the man can do with his hands in a given time, and then carefully note the result, and never allow that all sorts of conditions in and around the man can affect the quantity and quality of his work.

The alternative to this system, and, of course, this involves a great deal more trouble and energy on the part of the employer, is to develop the individual personality and enterprise of each workman. Workmen are too often looked upon as mere machines in spite of the fact that they have, in varying degrees, the same qualities of mind and ambition which guide and stimulate the lives of the autocratic individuals who endeavour to organise them.

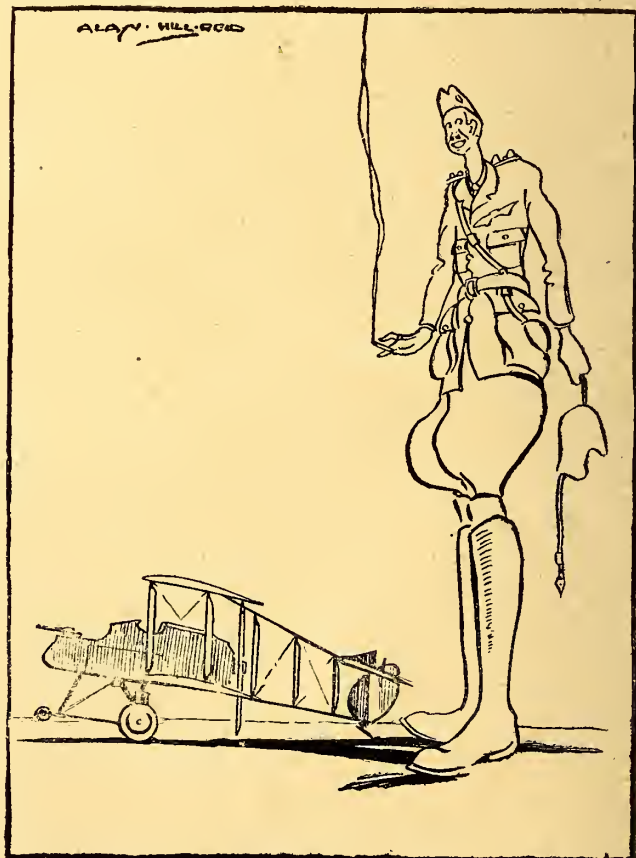
Quite apart from the increased value of the output, some scheme of handling labour on a more individual basis would reveal a large amount of latent inventive power which is now generally ignored.

The new and intricate work which has been undertaken by many firms during the war must have stimulated new ideas in the minds of their workmen. The wise employer will foster the development of those ideas. In how many cases has it been found that a workman working for one employer has had to take his new ideas to an entirely fresh market, owing to the fact that the employer cannot realise that Bill Smith the workman can also be Bill Smith the inventor. It is the old story that a prophet is not without honour save in his own country.

It is only necessary to remind ourselves of the very immature stage of development of the aeroplane industry to realise that, wonderful as the developments in the last ten years have been, they can be nothing in extent and importance to the probable developments in aeroplane construction during the next twenty years.

HEALTH AND EFFICIENCY.

It is hardly necessary to suggest to aeroplane manufacturers the advisability of healthy conditions, both with regard to living accommodation and working surroundings, to enable a man to produce his best work. Neither is it impossible to adopt that



"Now we know the reason why
Egbert smiles, when he is wont
To frown on all who come near by;
And strafe the ones who should—but don't.

All Hun-machines he'll soon be scoffing,
They won't remain long in the offing. . .
He's got a new machine you see,
Specially built by B. and P."

(A Cartoon from the "B. and P." Magazine, reviewed on p. 1016, which helps to promote good feeling between Capital and Labour.)

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IPSWICH, 176.
BURY ST. EDMUNDS, 32.

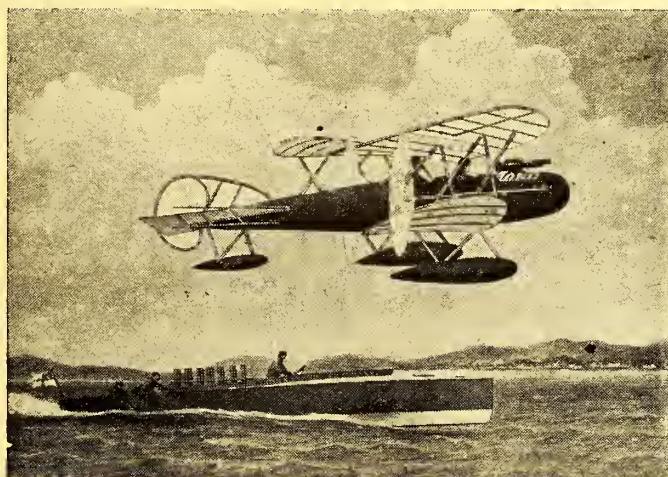
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system whereby the workman has a cash incentive to increase his output. Even in these days of Trade Unions it appears very strongly to the workman, and there is no doubt that it is profitable to the employer.

I remember while managing a factory some time ago I discovered a very complete system of warning among the men when I was going round the shops. Having discovered it, I immediately set to work not to punish the men for the elaborate system of many whistles which they had adopted, but to remove the conditions which made them think that such a scheme of warning was necessary. I succeeded by telling them that I did not expect them to work as hard as they appeared to do when I was about, but would rather that they should work for three-quarters of their time with real intelligence and enthusiasm than that they should keep on monotonously and without interest for the full sixty minutes to the hour.

I had intended to refer to the question of the development of aeroplane sales, but I find that I have already exhausted my space,

and that it would be impossible to compress such an important subject into anything less than a separate article.

THE DANGER OF PROSPERITY.

In conclusion, I would call to mind a remark made to me when I was starting in business to the effect that I should be lucky if I escaped early prosperity. Well, I did. I am afraid that most of the aeroplane firms are, and have been, unlucky in this respect. Prosperity has come to them easily and rapidly, and the purpose of this article is to warn them to take the necessary measures now to secure that when the artificial prosperity of the moment is no more, their businesses will be sufficiently soundly established and economically run to withstand any possible period of depression or keen competition.

Not only shall we be facing competition in this country, but we shall be up against those neutral countries who have had all the prosperity and none of the adversity of war, and who are now perfecting their arrangements to compete with us in this as in other industries.—H

The War in the Air; and Certain Developments.

Prophecy is merely the knack of assuming the inevitable egg, and crowing loudly for it. It is doubtless inconvenient to censors, and other high priests of laggard or incompetent administrations—wherefore the ancient statutory stoning of prophets—but one imagines that it may be very useful to G.O.Cs., admirals, aircraft squadron commanders, and all other practical individuals at the front of war responsible for its success; and knowing exactly what they want, and how much of it; but wondering sometimes unto despair, whether they are going to get it in time, or ever.

Thus, indirectly, prophecy may even be useful to the people who are being fought for—they being actually of one blood and mind and sure intent with those who are fighting, if only as a guide to their common demand in the first instance, and as a re-assurance—if and when the prophecy comes off—that after all the inevitable contingency was foreseen, and to the best of available means, provided for. It heeds confidence; which is moral. Besides, it does away with so much newspaper strategy of the noisier kind.

In these circumstances—merely those of every day of the war since August 4th, 1914—a technical and general Prophecy Department with powers of research, would probably be as useful as any Air Board, and ten times as much so as the Censor's; its moon-blind antithesis.

This, as a prelude to recalling a certain venture of my own in the way of prophesy; certain contentions I consequently advanced concerning air-craft development, several months ago. The base of which was, that hitherto, we had seen nothing but tactical work and its prime need of the short-distance, speedy, tactical-reconnaissance scout. And the substance thereof, that presently we should need the rather larger, but no less speedy kind of aerial t.b.d., for fighting enemy aircraft scouts, as well as for our own scouting. But that soon afterwards—and therefore to be numerously provided—we should want the largest and most powerful aeroplanes that could be built—even to carry half-a-dozen of a crew—not only for the most general aerial warfare, but for long distance strategical reconnaissance over other lines of country than two or more locked fronts, so soon as even one has been burst backwards.

As to the sources of any assumption or prevision of the kind,

these were various and often quite accidental, as irrelevant by themselves as any jig-saw piece, but no less related for their fitting. For one thing, in other days I happened to know the entire district of the Somme rather better than the Home Counties, and so downwards. Remembering, I should say, that it was an inconvenient place to retire from at all, unless speedily, and to a considerable distance. A matter of absolute deviation rather than mere evacuation to further defences a few miles away, when once the opposing pressure—in this case, our own—has reached certain points.

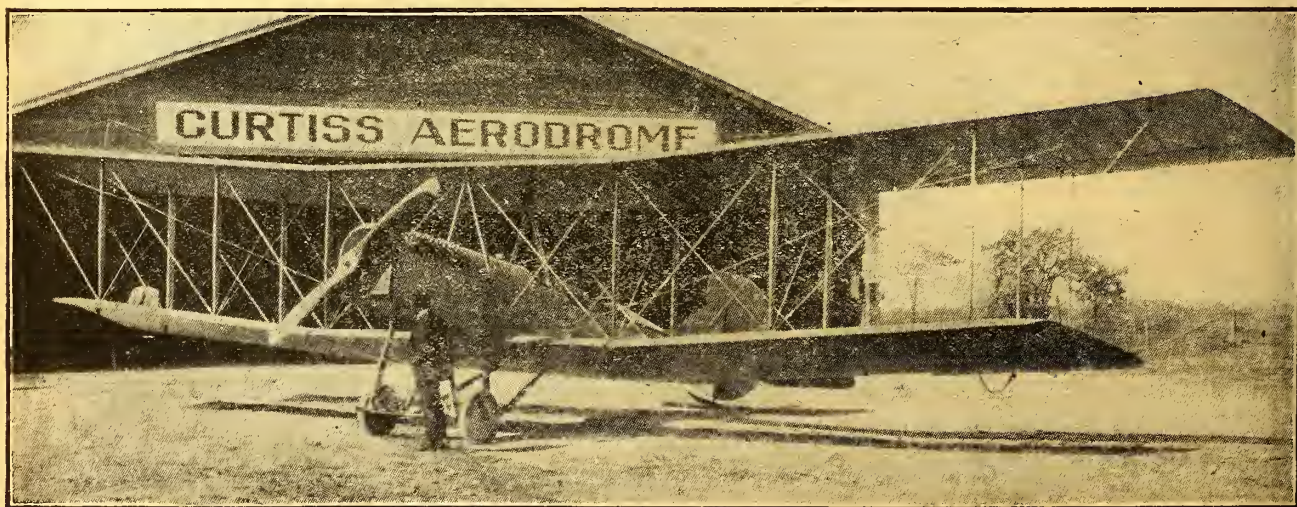
Such was one conclusion in the abstract: of the concrete detail of which, it being in the most competent professional hands, I profess to know nothing, as to when, or how, that burst backwards will occur. Nor of the next resistance to be expected; which will probably be just as strong, because on a shorter line. I felt merely confident that it will be distant, therefore new, and therefore to be ascertained on strategical lines.

Further gleams came—as they still come—as larger potentialities displayed by the smaller actualities. From the evidence of things seen, and more heard of a credible kind. Not so much said, as more clearly indicated by one's own friends in The Craft; which is full sister to The Trade of underseas, but more beautifully manifest, and only at Farnborough—by occasional mistake we hope—has ever been spent with a G.

From all of which—thereafter definitely confirmed in one's own way—it appeared that motors of X² power had not only been designed—as indeed one already knew in half-a-dozen quarters, hopeful of due recognition on high—but were actually being built; to oblige the Censor, let me say by tens; the less being included in the greater number.

Now from what I know of the more ancient motor-trade and craft, they will not draw a line, or even make print or core for a single example of any new type—much less enterprise the research and cost needed for an X² motor, let alone aught bigger—unless they are assured of a wholesale order of many series. No doubt, being British, they are unenterprising. But they are business men. Incidentally, patriotic enough not to waste an ounce of material or five minutes' effort upon any uncertainties.

But wholesale orders of power-members, X² or X³, do imply



The 60 foot Modified R.4. Curtiss on which Victor Carlstrom flew from Chicago to New York on Oct. 2nd and 3rd. The machine had a 160-h.p. Curtiss Motor.

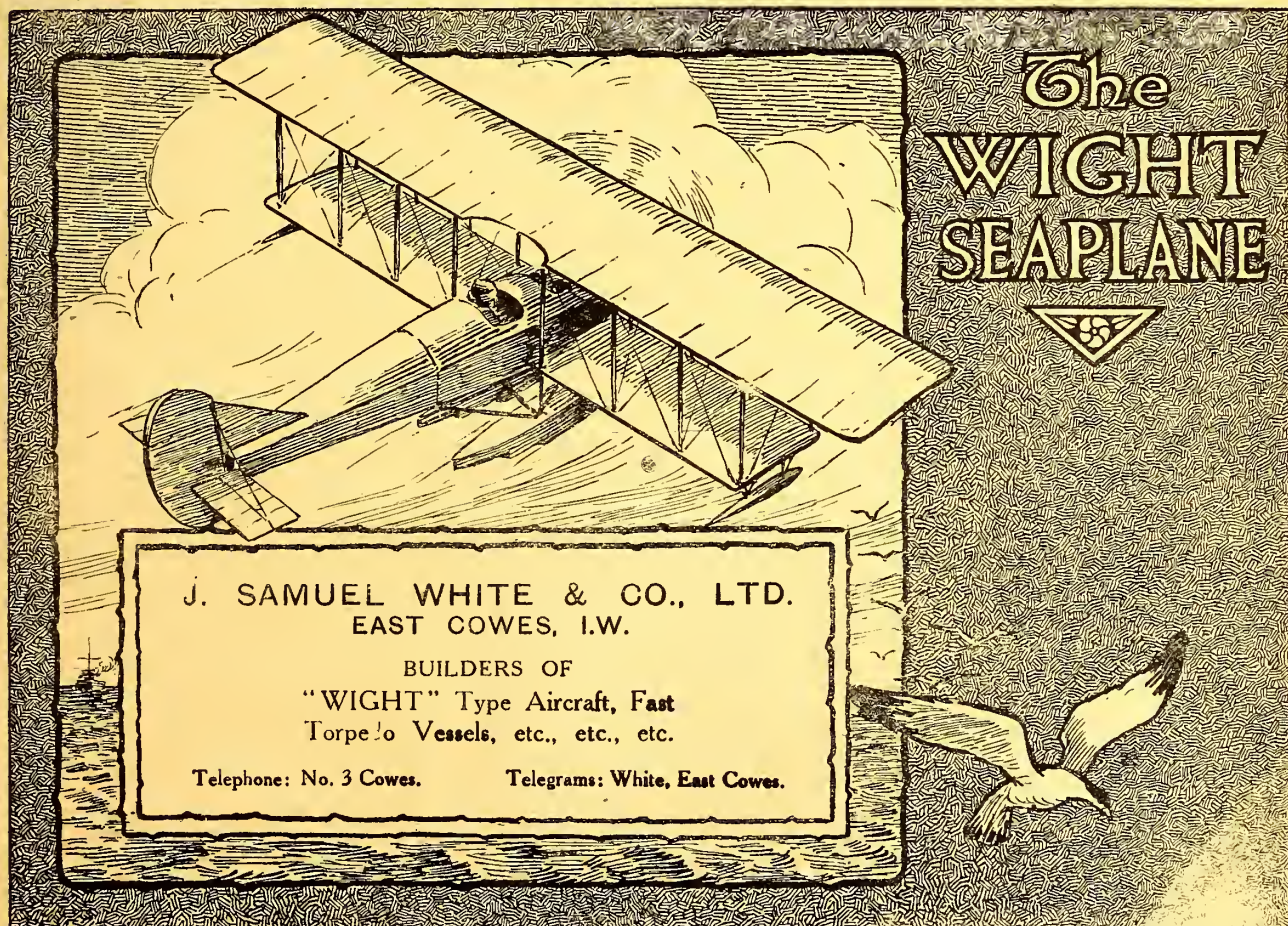
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the like creation—somewhere occurring—of the adequate type of units to the same number. And one does not fit X³ motors to an Avonmouth, Flickers, or Herring scout with a twenty-five foot span.

So—since in these days we rather announce intentions for merely formal approval than wait for departmental leave or initiation—one might readily, even six months ago, prophesy the creation in apposite numbers of an X³ type aeroplane to fit. Even on the assurance that it had to be, based on nothing firmer than a topographical memory; assuredly shared by possibly a thousand other persons, with or without red tabs, which is now a positive certainty to thousands more on the spot. Hence to be followed well in advance of the demand, by an X⁴ power-type unit as soon as it can be designed. Just as one knows of a vast paint-contract already given out, for certain Slavonian railways now in enemy occupation. All according to our astonishing, impudent British way, ever since some score of us took Nombre Dios and Acapulco, having walked across from the other ocean on purpose.

Yet seeing, after all, is the great seal of belief as well as prophecy. So, for the sake of those thousands, not above captain's rank, in all three Services, near or far from action, who alone have to work great marvels of quiet executive, hope-fully, but have no chance to know—let me say, fresh from eye-sight, that the X³ type aeroplane already exists in great plenty for their immediate glorious diversion and the Hun's greater and quicker undoing.

It happened thus. Going down the main street of an industrial village, a suburb—as might be Billancourt to Paris—of a certain British "fortified" city, I came upon two huge W.D. motor-wagons emerging from a side road, full of planes that stuck out yards behind. Behind these again, loftier than the tallest circus-caravan, were two more such wagons, each carrying a biplane, of certain dimensions; fully built, and except for motor and planes, complete to the last tin-clip. For the sake of the Censor or the enemy, who would probably know no such standards, let me express these dimensions in cubits and arshens: and say that each of these machines, from a quadrilateral landing chassis of at least six cubits—or an arshen-and-a-half—each side, rose to a height of some fourteen cubits or so. It had a fuselage about twenty cubits long by four deep in its crew-space, with still a motor-space in its mighty bows.

The one could have roomily held five men and all the arms, accoutrements and clockwork of any imagined fighting cruiser-plane. The other, the bulkiest of X³ power motors. Items further, the visible ends of the planes showed them curved after the fashion that spells climbing, speed in its degree, but above all distance-going according to tankage: an evident gap of more than two arshens between upper and lower: gearing for two propellers; the standing and running gear of a five-rater; and chassis-wheels and tyres that might have served a racing car. Withal, each giantess wore the rough-skinned completeness that establishes the long series ready somewhere behind its ensampling. I might add that each bore the name of one of those extraordinary British firms that will build you anything from a knock-down hut to a railway bridge, better than the specialists of other countries.

So much was visible enough. It was also evident that The Craft—being merely on earth—had lost its way. "You see" it explained, as it might have done a year ago to its house-master, "I have to bring fifty of these by road from — to here, generally, and get them housed at these places on this list before six o'clock if possible. And none of my men have ever been in" — the fortified city—"before. Can you by any chance tell me where, etc.?" It being none of my business, I did the little I could as thoroughly as I knew. So somehow the British responsibility in its teens in charge of a whole fleet did the rest, and piloted its units to shelter as fast as they arrived.

One is quite sure that the whole of that fleet or any other, will reach any Front where it may be sent, in no worse fettle.

This slight, ill-told incident of The Craft—apart from its confirmation of prophecy—has nothing much in it. It is too common and everyday an affair with The Craft as they work things out. It has hardly any point—unless you make one for yourself—to indicate precisely the sort of stuff of which The Craft is composed. But it has a few certain conclusions about it.

One is that The Craft, reckoned on the standard of any Cabinet Minister, is absolutely the cheapest thing in the Empire at any price, on results of that Empire's saving. That anybody can see. Another, readily visible—as exemplified by the existence of the aforesaid firms with their unfathomable productive ability—is that there is apparently no special magic about aeroplane building in size, type or numbers; nor much needed beyond honest material and faithful workmanship. There has merely been a little difficulty, and more deliberate hindrance, hitherto, in getting the right motors and enough of them.

But the third conclusion, as to our power-limit, I have merely seen for myself. We have X³ power, as it is, bigger or rather more powerful—than the enemy's or Ally's best. Now I happen to know we can manage up to X¹⁰ power at any rate, for it is only the re-duplication of the X⁵ power which I have seen running for hours, all out.—GEOFFREY DE HOLLEN-STONE.

AN AIRCRAFT GUILD.

There still seem to be one or two things left that men can do better. Go to Woolwich or any such place on a fine Sunday morning, and you will probably notice the superior popularity of fathers. Go to the Ritz or the Restaurant Chose in Soho, or to a timber-camp at the other end of things, and you will find that men cook better, because with more precision. There are also the incidentals of being a soldier, sailor, navy, coal-getter, docker, or porter, that they can probably do sufficiently better than women to have some leasehold on their job.

But few matters else, if any. Visit the drawing-office of the square mileage that is the General Electric Company of Schenectady, and you will see some three hundred ladies, any one of whom can not only draw but design you an electric motor for any purpose to the last screw in it. Or, not four miles from Charing Cross, go to any of the *cités industrielles* at Elystan Street, Cahill Street, and Jubilee Place, Chelsea—created by the Wells Aviation Company, Ltd., in some eight months—and you will see young women making every part of an aeroplane that unionism allows them to make from an autogenous weld to the sheer fiddle work of a built-up rib. Doing it so well, too, that unionism was perhaps wise, in the generation that ended when the war began, to exclude the possibility of such skill. So well, in fact, that a wiser unionism would be wiser still to include the actuality, in its own protection. And so will any craft-guilds of to-morrow which may grow out of the unions.

One hates industrialism, of course—or its ancient conception. The only worse thing is to have no industry, to shape up to all it ought to be. Which intention appears to have begun very wholesomely in this case. And as it is probably not the only one of like mind, it seems rather more than likely that motherhood, childhood, the home, and the rest of the essentials will get on in their turn quite well, left wholly to those concerned, with no more isms or doctrinairing. Very much the better after such a training as this, one would think, than in the old ruts of jam-making, needle-pushing, and scullioning by the million.

This by way of a first impression of a new works run in new ways. A second circumstance bred still others. This was that my conductor happened to be a progress-manager; whom elsewhere they call "a speeder-up" and eke "a chaser." Who—in this case, at any rate—is no sort of driver as you might imagine. On the contrary, he is a man whose special duty is to wander all over the place, to get to know every man and his way of work, and to find out from that man exactly what he wants, to make his work easier. Which thing being duly supplied or invented, the human assumption and result are that he will be happier and better pleased with his work, and so turn out more of it in the same time without overstrain. A new idea, no doubt. But it certainly works. This particular progress manager happens also to be honorary secretary of the firm's swimming and sports club, a fact not without its significance.

The immediately evident practical thing—the direct result of this system—that one noticed as much at Elystan Street as at Cahill Street or Jubilee Place—was that every bone of metal or wood in the anatomy of an aeroplane was made to jigs. Could not be made in any other way, in fact, in any stage of its making. And so, after being viewed by jig, went together by certainty, very speedily. Mostly, it was the old idea of the designing loft of the shipyard, crossed upon violin-making practice with the perfect jig on a board of greater or less size as the immediate progeny.

Suppose, for instance, the part was some rib. It had come, in the first instance, duly slotted and skeletonised from the milling-spindle as one of a hundred such, all to one jig. For one curve it went on to one many-stopped board, with that curve marked upon it, to which the plane rapidly brought that rib. In the same way on another board, for the other curve. Then to a fourth jig, in which it bedded smoothly between two lines of stop-keys, all set to the respective curves. To devise these things in consultation with those who work to them is only another part of the progress-maker's job. Which mutually engendered fact keeps up the pride of craftsmanship above the detail of repetitive monotony; and the hand becomes the keener for the skill assured to it.

The second practical thing evolves itself out of the fact of Elystan Street, Cahill Street, and Jubilee Place: three works, yet one, and not incomprehensible. Of course, the broad idea which we got from America, but is really of the day before yesterday, is to plant down in a single huge acreage and spread gradually. Which in the result means to fall over your own plant, and disorganise, and interrupt output wherever you try to spread another rood. Now, in crowded neighbourhoods such as Chelsea or any other non-industrial congeries of queer streets, the problem is to find room to begin at all. You can only do it in a patch here and another elsewhere. And so—as it seems to me—you are actually patched and islanded to your own advantage. For each island, being devoted to its special work, never need be transformed to any other work, and so can spread towards the others without interrupting its own output as the business grows, just as fast as its surroundings can be pulled down. It may mean makeshift this month, or some discomfort another time; both of which are temporary matters. The main result is growth without a day's or an hour's arrest of output, in the abstract. In the concrete,

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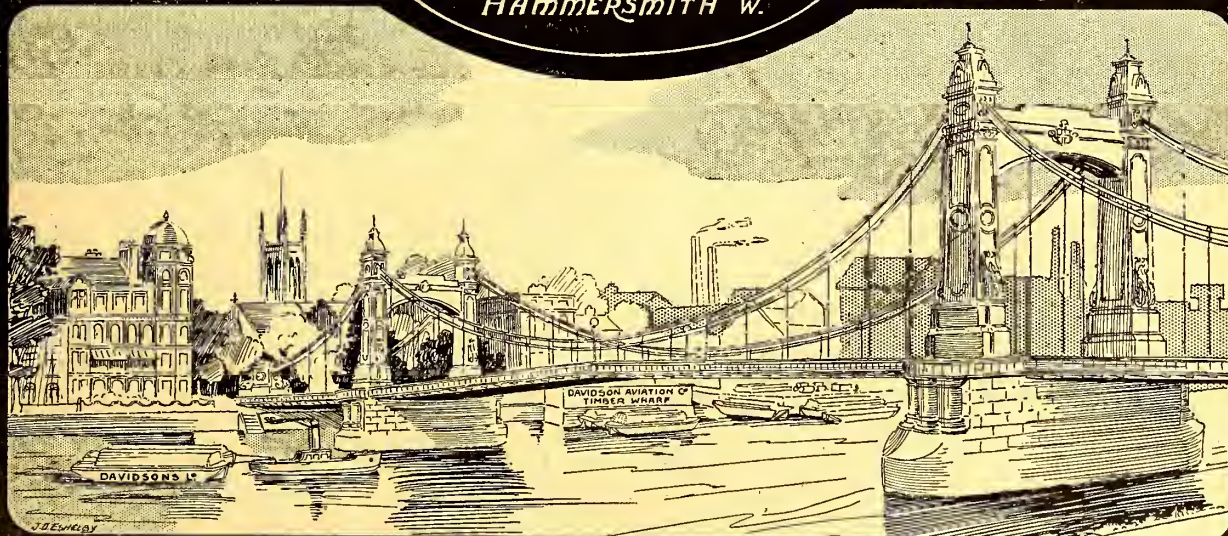
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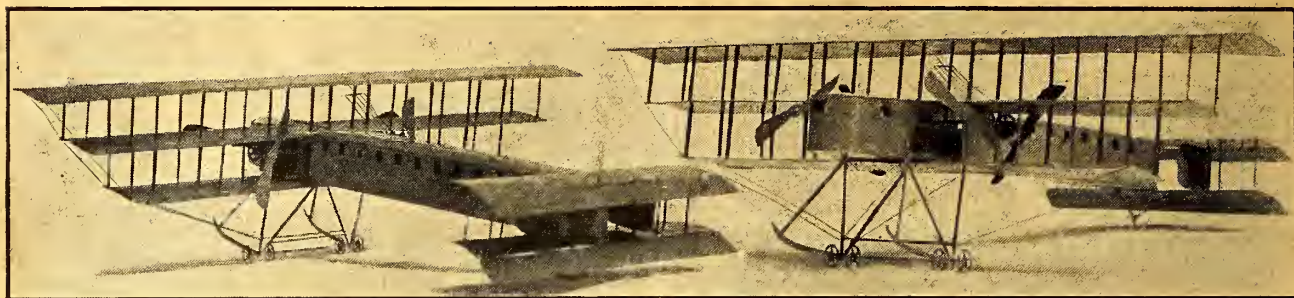
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A Model for an Aerial Super-Dreadnought made by a follower of Aviation in Brazil and reproduced from Brazil's only Auto-Sport Journal.

after only eight months' existence in this case, it means more aeroplanes a week—to say nothing of three times as many spares, repair-jobs, and stock-making—than the Censor would allow me to say.

So from a very general outline of the evident system of the Wells Aviation Company's works, and an indication of the spirit behind it, to the actual detail. At Elystan Street, the immediate thing is the wood-mill and its many spindles and planing-machines; just how many, concerns no one but those authorised to know. Beyond this a large stores, for the tools and fittings concerned with this and the next shop, which is wholly devoted to metal-working and welding. Every piece, nevertheless, going to a jig of some sort: mostly a moulding board.

The particularly interesting product here is a remarkable composite construction—to specifications of this or that design—of steel tubing for leading and trailing edges clamping on to wooden ribs. I should like to particularise, but may not; so can only say that the result is a marvel of strength and lightness, combining the advantages of both kinds of material. Hardly less interesting is the construction of certain tubular chassis; all to a jig-frame the exact width of the intended fuselage.

Above this is the tank shop dispersed round two galleries, where also the cowls of certain pusher nacelles are beaten out of sheet metal into the appropriate canoe-shape: cold, by dint of sheer hammer-craft on a leather pad on a post.

Then, at Cahill Street, there is a vast erecting and repair shop,

Every bit of it interesting, but quite imaginable to anyone who has ever seen an aeroplane close to, so nothing to describe particularly. The real thing behind it, only visible in the result, is the system, the whole effort of which, just here, is to see that there is no lack of one of those insignificant parts—it may be only a bolt of a size, a clip of a type—which hang up assembly.

Outside this, detail shops, mostly for lathe work and stampings, are going up as adjacent slumdom is coming down.

Jubilee Place is an island building that very long ago was devoted to scene-painting. Now its three floors are one vast aeroplane carpentry where all wooden parts are not only shaped, but assembled into complete planes; the said assembly being consequently as nearly as possible automatic, such has been the influence of the progress-manager and his fine work. There is so little apparent; so much to comprehend from essential ideas. For which, go—it may be to Wardour Street and see a fiddle built. Then multiply the effort and the work on a thousand-fold scale, marry it to fine metal-craft of three kinds, and you will be ready to comprehend all that goes on at Elystan Street, Cahill Street, and Jubilee Place: separate yet one and indivisible: a craft guild in itself

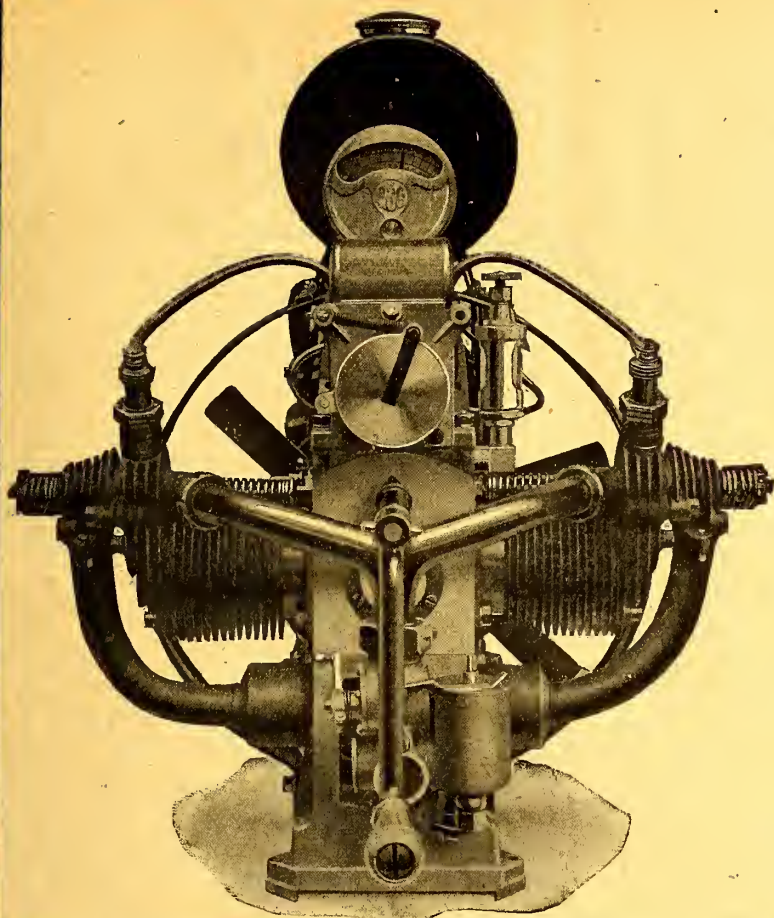
G. DE H.-S.

CONGRATULATIONS.

PICKLES—MARKS.—On Nov. 15th, Sydney Pickles, elder son of Mr. and Mrs. M. Pickles, of Sydney, was married to Adelaide (Bobs) Marks, only child of Mr. and Mrs. R. Marks, of Hampstead, at St. James's, Piccadilly.



Mr. Eric Bass in the biplane on which he has been experimenting the H. and H. camera at Hempstead Plain, New York.



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AN AEROPLANE CAMERA.

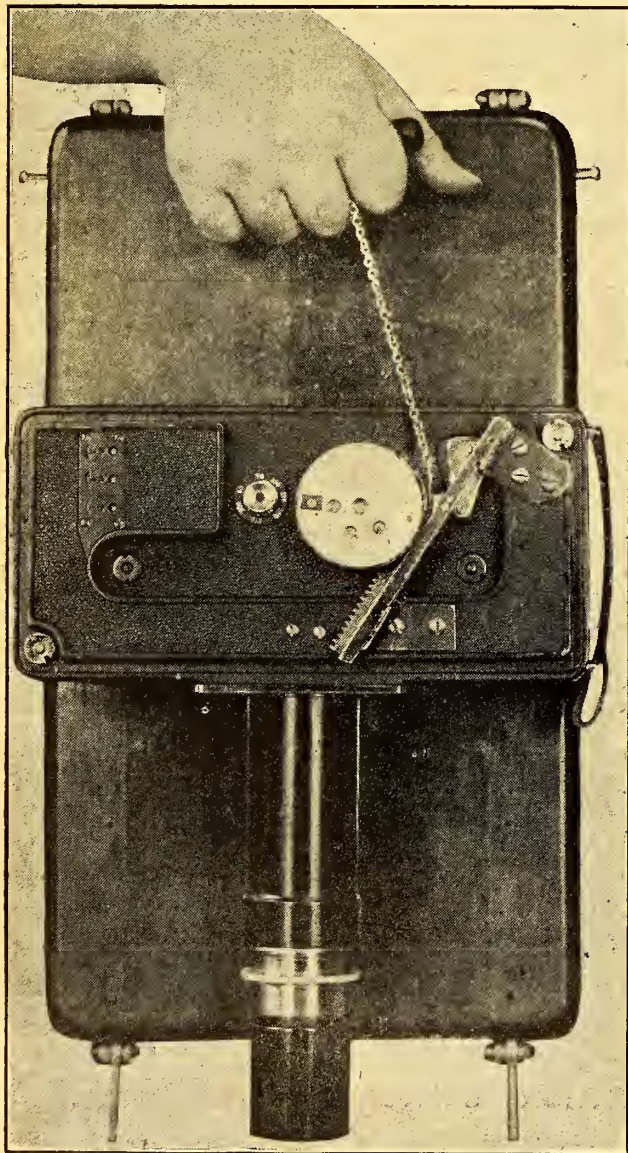
Some months ago this paper described briefly a special aeroplane camera invented and made in America. The article has produced the following letter from Mr. E. C. Bass, formerly well known in connection with Curtiss boats in this country:—

"I have kept up my interest in aviation, and it is through my endeavours that the 'multiple aeroplane camera, with kinematograph projector,' has come into being, of which you wrote to Messrs. Herbert and Huesgen, 18, East 42nd Street, New York City, on Sept. 7th. As I possess the entire foreign rights for the above-mentioned instruments, the firm has handed me your letter to deal with, and I should like to give you some particulars.

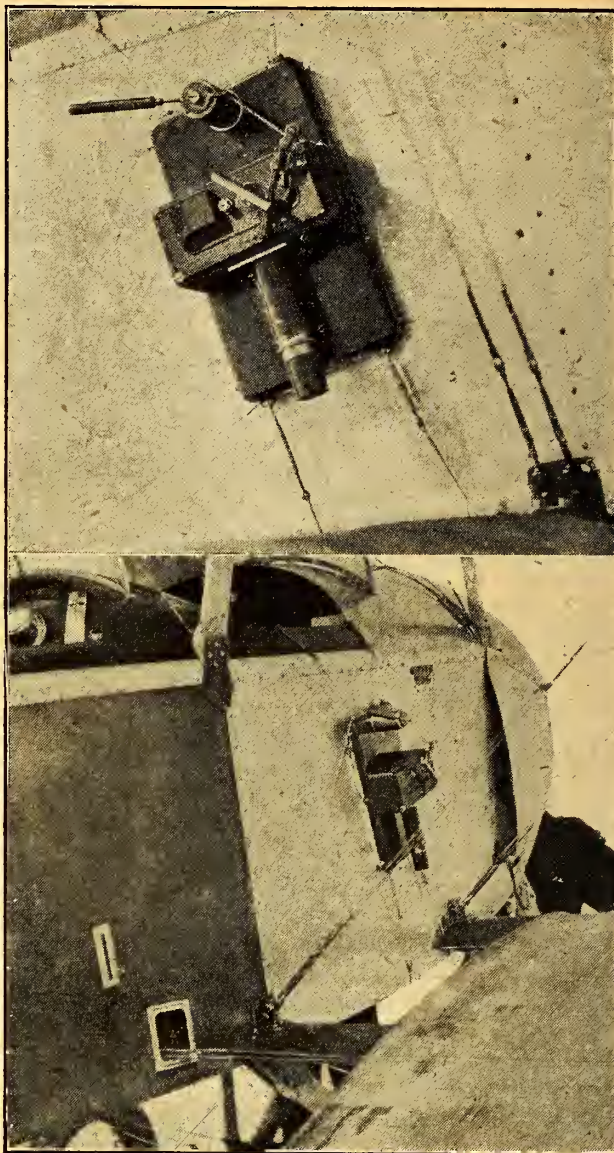
"I brought the idea to Herbert and Huesgen of a small compact camera, fitted with telephoto or long distance lens, capable of being operated at any distance from the operator by merely pulling a cord, the one action making the exposure, changing the film and setting the shutter for the next exposure, which can now be achieved by our latest instruments in less time than one picture per second, on a standard moving picture film. 750 pictures can be taken in one loading.

"A positive can be made of the film, and the pictures projected on a screen (by a special projector which does not burn the film) up to 8 feet in diameter, when the most remarkable details are observable, in distances up to 25,000 ft. A group of officers can stand round the screen and have all the results obtained during a flight depicted, and pick out those which present points of special interest. Paper enlargements can be made very satisfactorily up to a size approximating to a sheet of foolscap paper.

"The special value of the instrument is its small size, compactness, and the big volume of pictures that can be obtained in one flight, which really form a map of the territory flown over. Taking pictures at two a second whilst flying at 3,000 to 4,000 feet, they positively overlap.



The Herbert and Huesgen Camera.



Two views of the H. and H. Camera as fitted to an aeroplane.

"Herbert and Huesgen have done the financing to the tune of some £7,000, and all the technical work, whilst I have performed all the experimental flying for the last nine months, and I now reckon the camera to be perfected, and quite unique of its kind.

"We have lately had requisitions from the Russian, U.S.A., French, and other Governments, including the Japanese, who think highly of the instruments, and actually paid real money for same. England, early in the summer, ordered an experimental outfit, and, unfortunately, we forwarded the *very first* completed outfit, which had not been perfected as regards lens, shutter speed, or mechanical attachments, such as the latest cameras possess. The camera we sent merely had an ordinary focal length lens fitted, and slow shutter speed, which actually would not take very distinct pictures at any height over 2,000 feet, or whilst travelling fast in the air.

"However, this was pointed out, and suggestions asked as to the shutter speed required, what type of telephoto lens was favoured, etc., for it stands to reason that our camera can optically be made to take as good pictures as any in existence, when the results desired are decided upon, and the question of distance and speed from the object settled which have to be photographed. In fact, our camera, optically, has the advantage over those using a bigger film; for instance, a quarter-plate camera obtaining the same telephoto effect as we now secure with our long distance $4\frac{1}{2}$ lens would have to be some 30 inches in length, which would be unwieldy and block out the light. Besides, photographs of $\frac{1}{4}$ -plate and upwards will not stand enlarging, as will a minute picture, which, as you know, possesses greater definition.

"We have not heard from England officially, but a report reaches me that the outfit sent over has been tested, and the objections are that 'the pictures are too small, and not distinct enough, which, if true, is an unfair criticism, as they knew well enough that the film was of 'moving-picture' size, and capable of enlargement on a screen.

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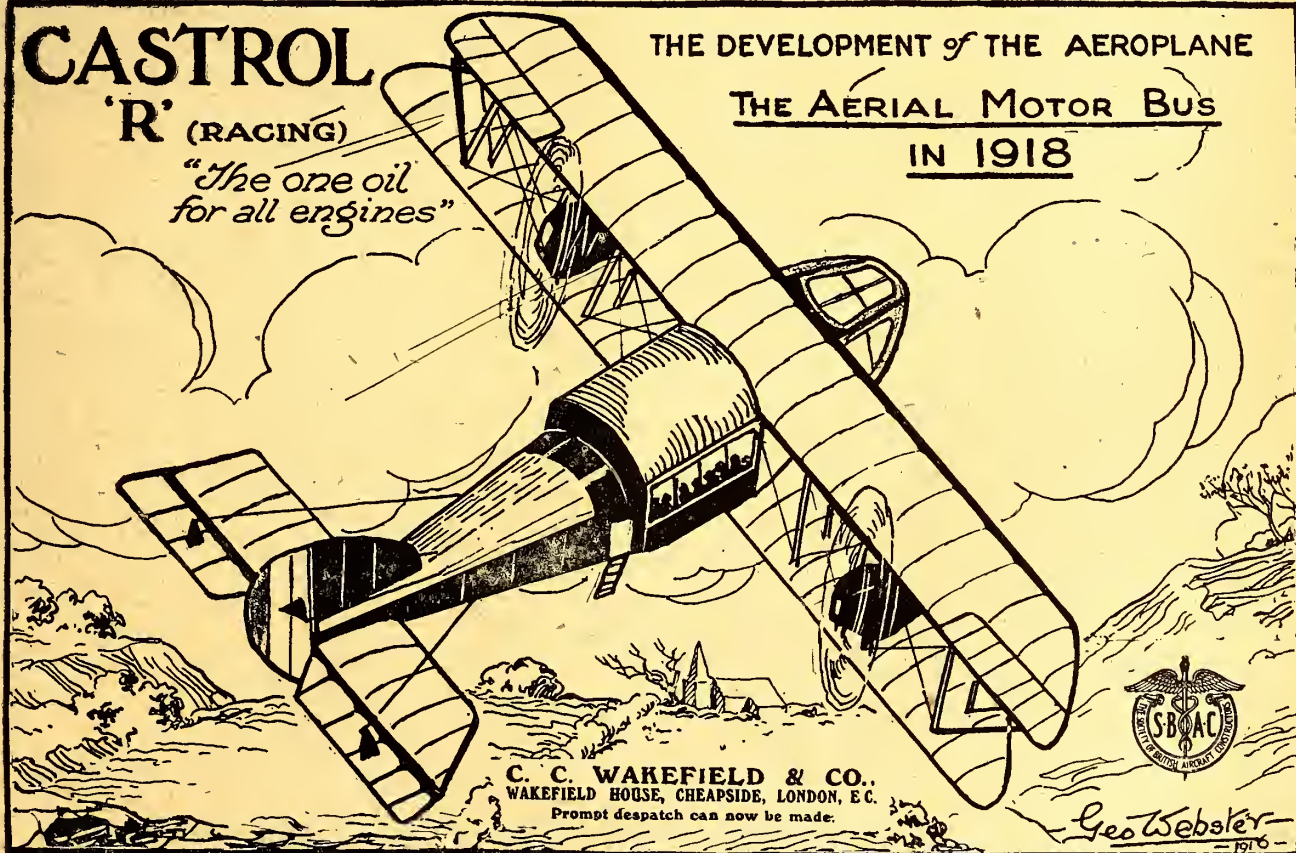
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Geo Webster
— 1916 —

"As regards distinctness, an ordinary lens of focal length 2 inches, with a maximum shutter-speed of 200, will not compare with our latest lens with a speed F-4-8 and focal length $4\frac{1}{2}$ inches, and a shutter-speed of 500, which give absolutely perfect pictures at any distance any other camera in existence will perform at.

"The focal plane shutter gives the maximum opening and light, and is the fastest type manufactured.

"It is a pity this cannot be pointed out to the officials concerned, as the camera we sent over was merely to illustrate the type, and at the time was not looked upon by us as the perfect instrument photographically, though it now is.

"I had a patriotic object in view in endeavouring to make this camera a success, and am sure that if it had a careful trial perfect results can be obtained. Merely three things require care—Pay attention to the film-changing mechanism, so as to keep it in order; secondly, experiment with different lenses suitable to the European atmosphere, and distances at which the pictures were to be taken; and, thirdly, find the proper shutter-speed to overcome motion and speed of the aeroplane."

[One hopes that the young officers who have been experimenting with the sample will make due note of this.—Ed.]

THE AERONAUTICAL LABORATORY.

One of the most interesting of the smaller war material factories in London is the Aeronautical Laboratory, at 9, Galen Place, Bury Street, W.C., and it is well worth a visit by those who are fortunate enough to be admitted therein.

The Laboratory is under the management of Mr. Griffith Brewer, who is also managing director of the British Wright Co., Ltd., and who was, incidentally, the first British subject ever to go up in an aeroplane—an act of heroism which he performed with Wilbur Wright long before passenger-carrying became a popular pastime with aviators.

Though one states that the Aeronautical Laboratory is producing war material, its products are actually as necessary to aviation in time of peace as in war, for it is devoted almost entirely to turning out the Ogilvie Air-speed Indicators, which are used in large numbers by the R.N.A.S. The Ogilvie Indicator was not only one of the first, but has remained one of the most successful speed indicators in the world. Like most other dial indicators, it is actuated primarily by a Pitot tube.

The internal mechanism is operated by a rubber diaphragm, and by some people this has been regarded as a weakness, owing to the supposition that the rubber will necessarily perish, and, consequently, vary in tensile strength as the instrument grows older. As a matter of fact, the rubber is so enclosed that it is not operated upon either by air currents or by light, and appears to have solved the problem of longevity. At any rate, instruments have come in after two years' continuous use, and on being calibrated have shown a variation of only about 2 m.p.h. from their original calibration—a variation which would be accounted for as easily by wear in the indicator spindle or metal parts as by any perishing of the diaphragm.

Work on these indicators is done almost entirely by female labour, and there can be few industries in which operatives exist under more pleasant conditions.

Some new instruments of very considerable interest were in process of experimentation when the writer visited the works, and when these have reached what is considered by the firm to be a practical point, they should add very materially to the comfort and safety of aviators.

A recent addition to the works is an experimental wind-tunnel, which has been most carefully and skilfully arranged by Mr. Brewer, and should be a valuable addition to the existing test plants for models in this country. The tunnel is capable of raising a draught of something like 50 m.p.h., and so should ensure considerably more accuracy in experiments than those in which a low wind-speed necessitates all kinds of elaborate calculations in reckoning what must happen at actual flying speeds.

The works are thoroughly well organised and run, and it is of considerable interest to see one who has been so long intimately concerned with the development of aircraft as Mr. Brewer thus developing under the stress of war into an actual manufacturer.

SIGNS OF THE TIMES.

A feminine reader of THE AEROPLANE sends the following cutting from a Surrey paper, and supplies the comments which succeed it:—

Temporary Young Lady desires post as Housekeeper or Companion, refined, experienced, capable of taking charge.—Write 66, — Office, Kingston.

Closely related, I presume, to the military hybrid the Temporary Gentleman, familiarly known as T.G. I wonder who will be brave enough to give houseroom to one who labels herself "refined"; also, I should like to know how long it will be before she reverts to her normal manners and customs.

"THE AEROPLANE" ON THE VELDT.

The following amusing letter has been received from a South African reader:—

"I have been a constant reader of THE AEROPLANE ever since the Cape Town agents started getting same. I congratulate you, and note how strict you are concerning the various articles—on which you have your doubts, which you generally correct or the like.

"Anyhow, my object in writing is merely that I am enclosing you a snapshot, which was taken by myself, and has a sort of half-natural interest attached to it.

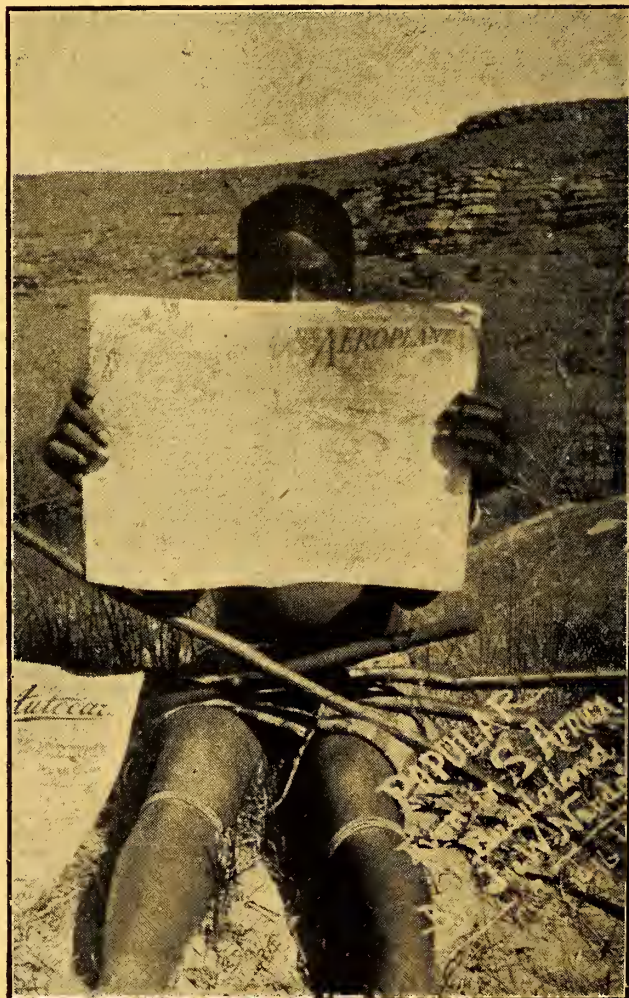
"I am here in what we South Africans call 'Kaffirland.' No man (European) is allowed to farm in the native territory, therefore, here only abound native traders and such like as attorneys, doctors, etc. However, re the snapshot. I am an invalid on sick leave. Am staying here with my people. I was out one day shooting wild duck along a river. I also carried my camera and several papers to read (as I was bent on a whole day's outing). Presently, a raw Kaffir boy picked up one of my papers to have a peep for pictures. THE AEROPLANE was the first, and he got rather inquisitive, so I had to explain him the illustrations. One happened to be a Curtiss J.N. model, also (luckily) a photo of a Zeppelin.

"To my amusement and his astonishment, he sort of grew enthusiastic, and could not grasp, when I said these 'things' (aerial machines) soar up into the air like a 'inthagar' (bird), and have engines larger than motor-cars (latter are as common here as salt). These natives half believe that a man can fly over 100 m.p.h.

"I send THE AEROPLANE (old copies) and other aeronautical papers to my relatives now fighting that 'plague' the Hun in German East Africa. They thoroughly enjoy the fighting in the air paragraphs but do not quite grasp the other technicals.

"I regret to say I am an invalid, and cannot share punishing Huns! (although I am from Boer parents!) I, therefore, do what I can to cheer them.

"Best wishes!—I am, yours sincerely, JOE W. NAUDÉ. Mechanic."



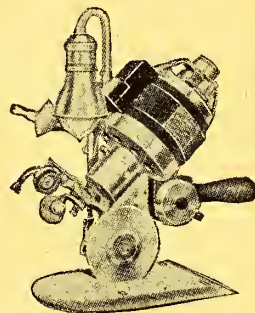
A New "Reader" of "The Aeroplane."

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ROTARY EASTMAN

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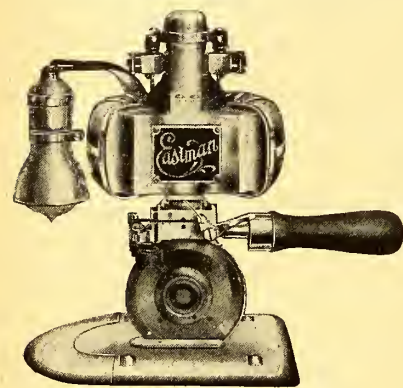
The Evolution of Fabric Cutting Machines.

The leading tendency of the present industrial age is the substitution of machine work in every branch of manufacture. It is through the increased production which the substitution of machinery brings about that we are able to meet the increased demand for all kinds of luxuries and necessities demanded by the increasing population of the world and the increasing standard of living adopted by the majority of inhabitants.

One of the most notable advances which has been made in the substitution of machine for hand work is exemplified in the manufacture of all kinds of ready-to-wear clothing, underwear, etc. In the beginning practically all clothing was made by hand,

a long, laborious process at the best. The result was that a great majority of people found it difficult to obtain enough clothing to keep themselves properly covered and protected from the ravages of the climate.

The first great step in the clothing industry was the introduction of the sewing machine which, as finally perfected, enabled one operator to turn out in a day as many garments as could formerly be turned out by the same



First Eastman Rotary Machine.

operator in a month. It was still necessary, however, to cut the cloth from which the garments were to be formed, by hand, either singly or a few garments at a time. Then came the long knife where the operator was able to cut a number of thicknesses, using a blade about two feet long worked through a slot in the table. To use this, however, it was necessary to section the goods to be cut up into small, short lengths so that they could be brought to the part of the table where the knife could be operated. This necessitated handling the goods two or three times, and at the same time was apt to disarrange the lays.

Next came the first cloth cutting machines, clumsy, heavy affairs driven by belts, the knife carried on a long swinging arm. These machines were stationary and the goods had to be brought to them as formerly. Also it was impossible to cut cloth piled up to any great thickness with these machines.

Then the band knife was introduced. It also was stationary and the work had to be brought to it. However, it was capable of cutting up cloth in considerably thicker lays and in certain classes of work is used to-day. About the year 1890 the first practical electric motor driven portable cutting machine was brought out. The knife was of the rotary or disc type, but the motors were so heavy and the cutting capacity so small that these machines were not very practical.

The first patents on cloth cutting machines were secured by J. Harraday, Albin Warth, I. Fenno, Francis Eschbach and Frank Nevins. The Harraday patent was secured in 1854, and is the initial one pertaining to mechanical cloth cutters that was ever issued. It was not a portable machine; the goods had to be taken to it and the knife worked on something of the principle of a scroll saw.

The Warth patent, dated August 2nd, 1870, was the next taken out on cloth cutters. It also was a stationary machine, with the mechanism under the table, instead of above, as in the Harraday device, and a straight knife was used.

Next came the Fenno patent, dated 1873, which showed what was called the long arm type of cutters, in which the knife was driven by belts and was a rotary disc cutter. Eight years after having secured his first patent Mr. Warth patented another, which also had a long arm and a rotary disc cutter.

The Eschbach patent, secured in 1886, was for another type of stationary rotary cutter, driven by an electric motor.

The Nevins patent, dated 1887, seems to be the first reciprocating cutter, driven by an electric motor, patented up to that time. As far as is known, however, none of the Nevins machines were ever made or put on the market. Any number of other patents were issued on various cutting devices, but the majority of them were impractical and never made. Fenno and Warth, however, did put out some machines commercially, and a number of their different types were used.

Shortly afterwards the Eastman Machine Co. designed and put on the market the first practical straight knife cutting machine. This machine was so arranged that the knife was driven by an electric motor at 1,400 or 1,500 strokes a minute. The knife, carried on a standard also carrying the motors, could be moved freely over the table on which the folded cloth was laid. These earliest straight knife cutting machines were capable of taking care of layers $1\frac{1}{2}$ to 2 inches thicknesses.

In the twenty years that have ensued since the Eastman Co. brought out the first straight knife machine, they have improved and refined the original model until to-day the latest Eastman is capable of turning out from five to six times as much work in the same length of time as the earliest model. The motor of the latest Eastman Cutter runs as high as 3,000 r.p.m. and the knife blades have a cutting speed in feet per minute of as high as 962 feet. These speeds are made possible by the use of roller bearings, special hardened tool steels, and the utmost refinements known to mechanical and electrical arts. The cutters run absolutely without vibration and, with two or three minutes a day devoted to oiling, will run without repair or difficulty for years.

Latest model Rotary Eastman.

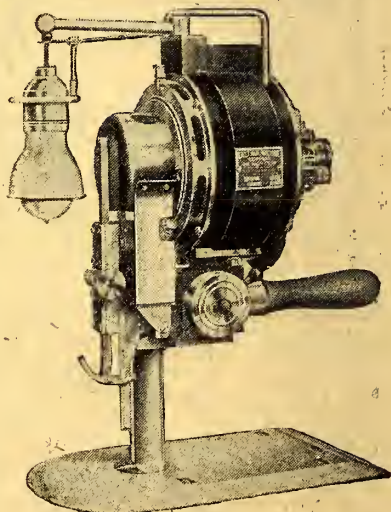
The straight knife or reciprocating type is the one best suited to general all round cutting, as it will take care of both high and low lays and cut the top and bottom thicknesses absolutely alike.

The Eastman Co. have made as many improvements in the rotary machines as to the straight knife cutters. The rotary models are now made with knives as large as $5\frac{1}{2}$ inches in diameter, though the popular size has a diameter of 4 inches.

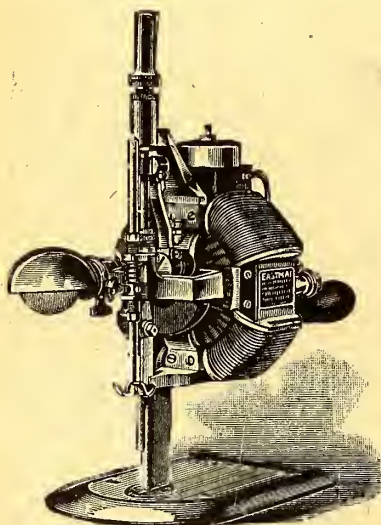
The Eastman Co. has just brought out and are introducing an entirely new type of model of rotary machine. It is designed particularly to work on layers not exceeding one or two thicknesses and is to take the place of shear cutting. This new model Eastman rotary weighs $4\frac{1}{2}$ lbs., and will enable an operator to cut up three times as much work in a day as could possibly be cut with shears. Such a type is particularly well adapted to cutting out aeroplane and balloon fabric.

While the cutting machine was originally designed for the ready-to-wear clothing trade the enormous possibilities inherent in it have led to its adoption in all kinds of industries where the cutting up of fabric is a necessary step in manufacture. Overall makers, muslin underwear makers, knit underwear makers, mattress makers, automobile and aircraft builders, etc., are all using the machine to-day with maximum advantage and profit to themselves.

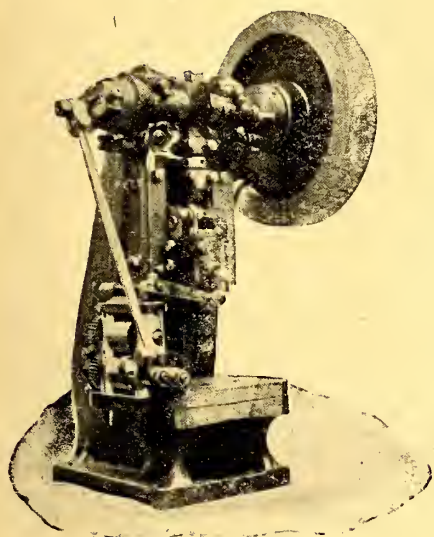
Any factory which finds it necessary to cut up cloth can easily increase its output and efficiency by using one of these cutting machines, particulars of which will be freely given by Edward J. Goodwin, 1, Talbot Court, Gracechurch Street, London, E.C., sales agent for the United Kingdom.



New "1916" Reciprocating Eastman.



First Eastman Straight Knife Machine.



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SOME WORKS MAGAZINES.

THE "B.-P."

There is no doubt that the War has brought about a better understanding between the various classes of the community. This is, of course, the more apparent in the Army, where labourer, mechanic, lawyer, and gentleman fight side by side, often companions in the ranks, sometimes the social superior occupying for the nonce the inferior military position. But the same kind of feeling exists in the great industrial army that is keeping the men at the front supplied with all the appurtenances of the war, and the broom boy and the fitter, the lady acetylene welder, the foreman, the works manager and the managing director are beginning to realise that each and all are indispensable to the whole, and that the man who works on the capstan lathe is doing his bit with as much effect as the man who interviews the Government buyers.

Many firms are encouraging this *entente cordiale* by providing facilities for the production of a works magazine devoted to the particular interests of their own staff.

One of the most successful of these productions is the "B.-P.," the organ of Boulton and Paul, Ltd., of Norwich, who are actively engaged upon aircraft work.

The November issue is full of interesting points. The frontispiece consists of a full page portrait of Mr. W. H. Hiske, assistant managing director of the company.

The editorial notes are followed by a continuation of an able article on the Development of Artificial Flight, which is illustrated by a curious old drawing of the first Aeronautical Exhibition, held by the Aeronautical Society at the Crystal Palace in 1868, in which can be seen Stringfellow's triplane.

An interesting account is given of the work done by the firm and staff in endowing beds for soldiers in the Norfolk and Norwich Hospital.

The "B.-P." also contains an article on "Aerial Tactics and Strategy" by "An Air Pilot," a nom-de-plume which seems vaguely reminiscent of Dover. Some clever cartoons of workshop celebrities have been turned out by "W. B. A." in a style which must be pleasing to the owners of the faces.

A feature which is worthy of special commendation in the "B.-P." is the competitions page, which consists of problems the solution of which will be of considerable instruction to mechanics, and may even be responsible for the discovery of

new methods of manipulation of difficult jobs. One problem—how to make taper washers in a lathe simply and speedily—brought forth some very ingenious replies.

THE "AUSTIN ADVOCATE."

Another interesting works magazine is the "Austin Advocate," published by the Austin Motor Co., Ltd., which has now reached its sixth volume.

The November issue is chiefly occupied by congratulatory messages from representative readers on the occasion of the magazine's sixth birthday.

Some interesting information is supplied regarding lighting installations to comply with the new lighting order.

Another feature of the "Advocate" is an article entitled "The Diagnosing of a Strange Engine Noise."

All told, this little magazine is a credit to its producers.

FOR SUB-CONTRACTS.

The National Aircraft Manufacturing Co., of Printing House Yard, 15a, Hackney Road, N.E., intimate that they are in a position to take on special contracts for aircraft work, preferably wood-work, to almost any extent.

Mr. Fred Norman, who was connected with the early days of aviation in Scotland, is in charge of the Works, and the hands are almost entirely East-end cabinet-makers who are used to handling good quality wood and working to fine dimensions.

They have already done some very good work, and firms who are placing specifications for sub-contracts can therefore inspect aircraft work in process of construction and assure themselves that the quality is all that can be desired.

AN UNEXPECTED ALLY.

One of the most interesting things in connection with the spread of the Aircraft Industry is the unexpectedness of the class of firm which takes up aircraft work. A communication has recently been received from the Dairy Outfit Company, Ltd., of 251, 253 and 255, Pentonville Road, King's Cross, N., stating that they wish to take up work in connection with aeroplanes.

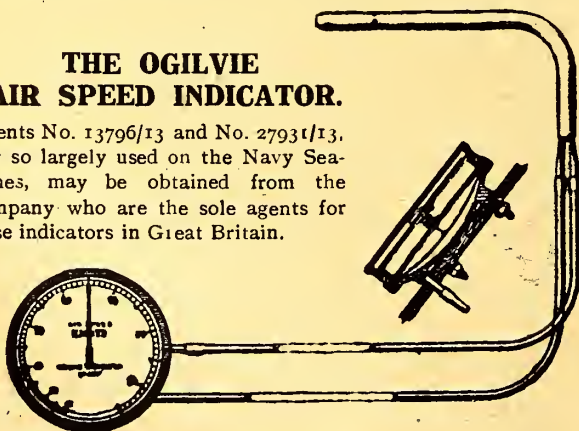
This firm has a well-equipped workshop originally occupied in making milk-cans and those peripatetic barrels known as "milk-churns," which make such a noise on railway platforms. Consequently the works are particularly well suited to turn out any

The BRITISH WRIGHT Co., Ltd.

In view of the arrangement made between the Treasury and the British Wright Co., Ltd., in respect to the free use by the Navy and the Army of the British Wright Patents, the Directors of the Company beg to notify all British Manufacturers that machines embodying the constructions so patented, may be freely manufactured in pursuance of such Government orders. The Company is prepared to receive applications from British Manufacturers for licences to manufacture under the Wright Patents in respect to machines for private use in Great Britain or for export to Foreign Governments.

THE OGILVIE
AIR SPEED INDICATOR.

Patents No. 13796/13 and No. 27931/13, now so largely used on the Navy Sea-planes, may be obtained from the Company who are the sole agents for these indicators in Great Britain.



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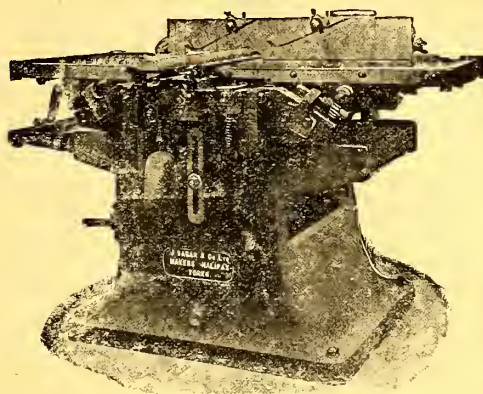
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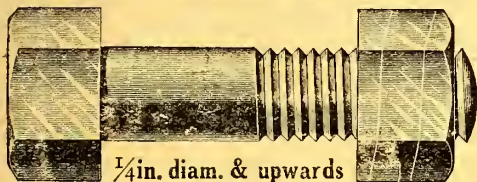
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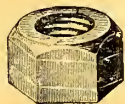
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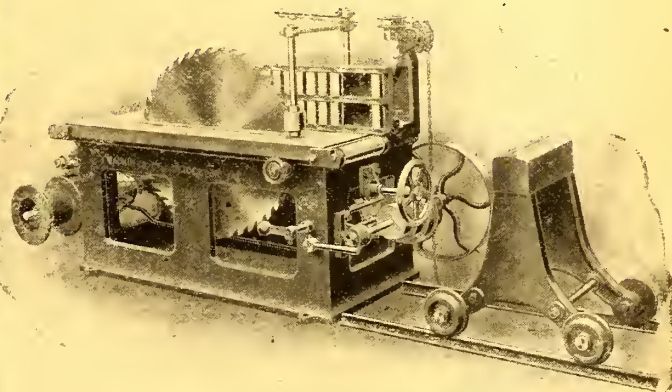
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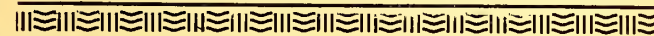
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WHEN CORRESPONDING WITH ADVERTISERS.

form of sheet-metal work, such as petrol and oil tanks, engine cowls, specially shaped plates and panels for body work.

The firm has already been engaged on the manufacture of motor wings and mudguards, so that their men are by no means nomoniacs on milk receptacles. One can, therefore, recommend any aircraft firm which wishes to sub-contract sheet-metal work of any kind to get in touch with the firm in question.

AIRCRAFT ACCESSORIES.

Mr. Leo Harris, who long ago established himself at Wolverhampton as a specialist to the motor and general engineering industries, is now interested in several things which should be of great use in the aircraft industry.

Incidentally, Mr. Harris is a very old hand in the mechanical transport business. Many years ago he was intimately connected with the bicycle trade and later with the motor and motor-cycle industry, and his entry into the aircraft business is merely a natural step.

Mr. Harris, who is a director of Hays, Hunter and Standen, Ltd., of 110, Cannon Street, London, E.C., can give delivery of all kinds of high-speed tools, such as drills, reamers, milling cutters, band saws, etc., and also deals in bright drawn steel bars, rounds, hexagons, and squares, and many other articles, both in the raw and manufactured state, required in aeroplane construction.

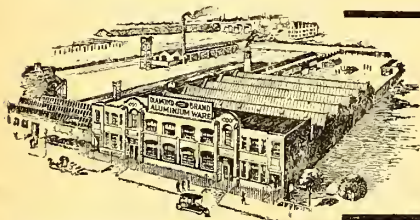
Messrs. Hays, Hunter and Standen are also sole sales agents in Great Britain for the well-known "Fastnut" washers, which are one of the best things of their kind produced, and are used by many railway companies, locomotive builders, and truck manufacturers. The "Fastnut" washers are also used exclusively by the London General Omnibus Co., Ltd., and one of the biggest aeroplane constructors in this country is adopting them after very severe tests.

Mr. Harris is also the Midland agent for the Imperial Light Co., Ltd., who not only supply most efficient oxy-acetylene welding plant, but undertake themselves to do welding of all kinds for the trade.

Inquiries should be addressed to Mr. Leo Harris at Temple Chambers, Lichfield Street, but he will shortly be moving into more convenient offices in the same street.—W. L. W.

A GOOD YEAR.

The Sunbeam Motor Company has enjoyed a greater volume of business than in any previous year. The dividend for the year is again 15 per cent., but there is, in addition, a bonus of 3s. a share, as against 2s. a year ago.



WELDING JOBS.

Mr. C. W. Brett, of Barimar, Ltd., writes:—The Editor's several references to the Barimar Scientific Welding process in these columns, and the Company's announcements, have been the means of bringing to Barimar, Ltd., sheaves of inquiries from all parts of the Kingdom. The writers inquire whether certain parts can be repaired, and they ask for approximate prices of repairs roughly described in series of sketches. Barimar, Ltd., desire to make known the fact that though in ninety-nine cases out of a hundred successful repairs can be made, it is impossible to quote prices for such work with any degree of accuracy from such sketches. The quickest and best plan is to send the fractured part, carriage paid, to Barimar, Ltd., 10, Poland Street, Oxford Street, London. Expert opinion with price and date of delivery will be sent by return post.

[Will readers kindly note.—Ed.]

FOR PRISONERS OF WAR.

The following amounts have been received during the week ending Nov. 15th for Muriel Countess Helmsley's and Mrs. Rowton's Fund for Prisoners of War in Germany:—From the employees of Vickers, Ltd., Weybridge Works, £6 8s. 9d.; from the employees of Vickers, Ltd., Bexley Heath Works, £3.

SCHOOL REPORTS.

HENDON.

AT THE GRAHAME-WHITE SCHOOL.

Instructors: Messrs. Winter, Biard, Hale, Pashley, and Fitzsimons.

Pupils with Instructor: (Straights) Messrs. Balden, Coltman, Fielding, and Nightingale.

Circuits with Instructor: Messrs. Pearman, Flynn, Sutherland, Travers, Munro, and Kaizer.

Circuits alone: Messrs. Ranson, Hitchcock, Rogers, Steeves, Norris and Lord.

BOURNEMOUTH.

AT THE BOURNEMOUTH SCHOOL.

Instructors: Messrs. E. Brynildsen and H. Smith.

Pupil with Instructor: Mr. Ross.

Rolling: Messrs. Vermorel and Fisher.

Straights alone: Messrs. Ross, Hall, and Peat.

Half circuits alone: Mr. Allen.

Eights and circuits: Messrs. Burry and Holland.

Machines in use: 35, 45, and 60 h.p. Caudron tractor biplanes.

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THE TWELVE-CYLINDER CURTISS 250-h.p. MOTOR.

The Curtiss Aeroplane Company has recently built a 12-cylinder 5 in. by 7 in. motor. This engine weighs but $3\frac{1}{2}$ lbs. per horse-power and develops 300-h.p. at 1,400 revolutions per minute.

The characteristic feature of the engine, seen in the view from bottom of crank-case, is the very large, counter-balanced crank-shaft, having a bearing between each crank. The crank-pins are $2\frac{1}{2}$ in. diameter and the main journals of $2\frac{3}{4}$ in. diameter. The bearing caps not only show 8 bolts to each one, but are steel-keyed into the crank-case to prevent any lateral movement. Also individual forced lubrication enters through the bottom of each cap where the load is greatest on the bearings. A large annular thrust and radial ball-bearing are contained in the housing shown at the left end of the illustration.

Two separate 12-cylinder Dixie magnetos furnish double ignition with the consequent reduction of the chances of mis-firing. Two Duplex Zenith carburettors are used.

The seven steel tubes supporting the engine on its frame are pressed clear through the crank-case, and, therefore, receive all the strain of the mounting. A decompressing device makes cranking easy. Installation of self-starters is readily possible with this type of engine.

GENERAL DESCRIPTION.

Type of Motor.—12-cylinder water-cooled Vee type. Separate cylinders.

Horse-power.—Rated 250-h.p., giving 300 h.p.

Motor Speed.—1,400 r.p.m. normal; 1,500 r.p.m. maximum; 200 r.p.m. minimum.

Bore and Stroke.—5 by 7.

Weights.—Motor, 1,125 lbs.; radiator, 120 lbs.; cooling water, 100 lbs.; propeller, 95 lbs.

Gasoline Consumption per Horse-power Hour.—6/10 lbs.

Oil Consumption per Hour at Maximum Speed.—2 pts.

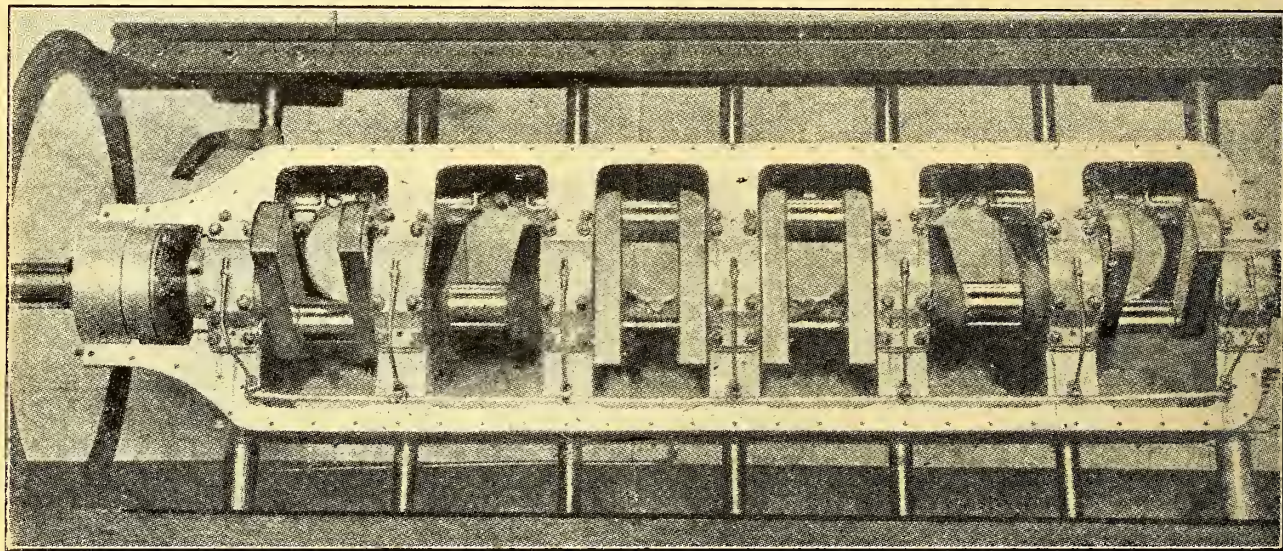
Installation Dimensions.—Overall length, $84\frac{5}{8}$ in.; overall width, $34\frac{1}{2}$ in.; overall depth, 40 in.; width at bed, $30\frac{1}{2}$ in.; height from bed, $21\frac{1}{2}$ in.; depth from bed, $18\frac{1}{2}$ in.

Equipment.—Magneto, carburettor, exhaust, manifold, radiator, propeller, tachometer complete, self-starter, tools, shipping-box.

DETAILS OF MOTOR.

Ignition.—2 high tension 12-cylinder magnetos located on front of crank-case cover and driven off timing-gears through new wear-saving flexible drive. Leather boot on magnetos. Rubber covers on spark plugs.

Carburettors.—Four "Zenith." Each intake supplies one set of 3 cylinders through separate cast aluminium manifolds. Hot air intakes to carburettor through stoves around exhaust pipes.



Underneath View of the 250-h.p. Curtiss Motor, showing lubrication pipes to each bearing.

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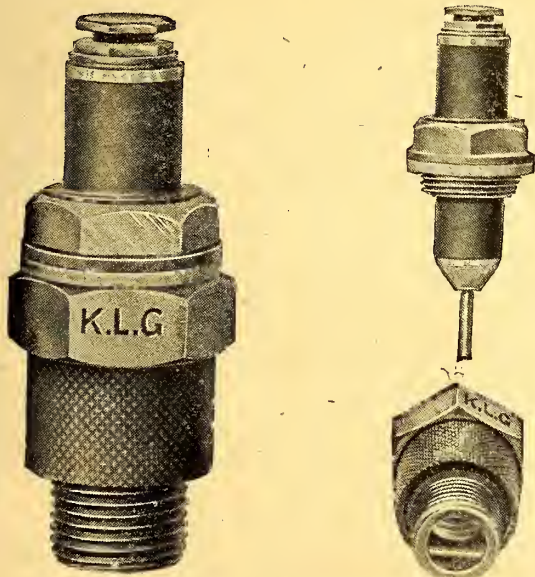
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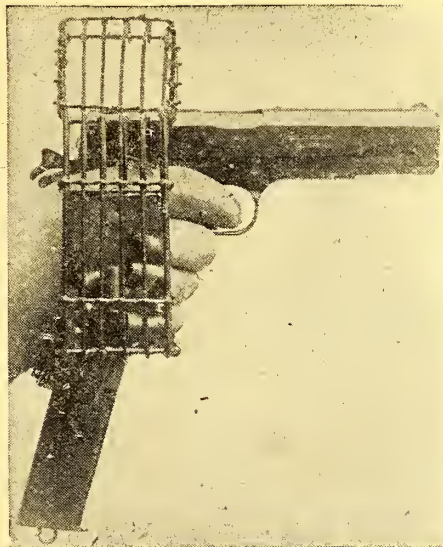
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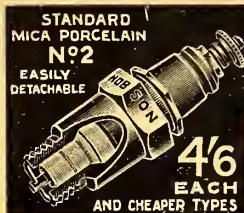
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Water Circulation.—Centrifugal pump bolted to front end of crank-case cover and driven through spiral gears mounted on ball-bearing shaft.

Cylinders.—Made of high carbon steel drop-forging machined all over. Monel metal side wall brazed on. Outside of cylinder heavily nickel-plated to prevent rust. Cylinders bolted to crank-case by 12 bolts.

Valves.—Poppet type in head. Intake nickel steel. Exhaust tungsten steel.

Valve Springs.—Coil type intake. Offset type exhaust.

Valve Gauges.—Valves seat direct in cylinder-head.

Rocker Arms.—Drop forgings case-hardened and nickel-plated.

Cam Followers.—Plunger type open-hearth steel, case-hardened. Cam Follower Guides.—Manganese bronze. Bolted to case by two studs.

Cam-shaft.—Open-hearth steel drilled hollow, cams integral 7 bearings, cams case-hardened, bearings and cams ground.

Cam-shaft Bearings.—Aluminium alloy castings. Split type bolted together and held in crank-case by locked set-screw.

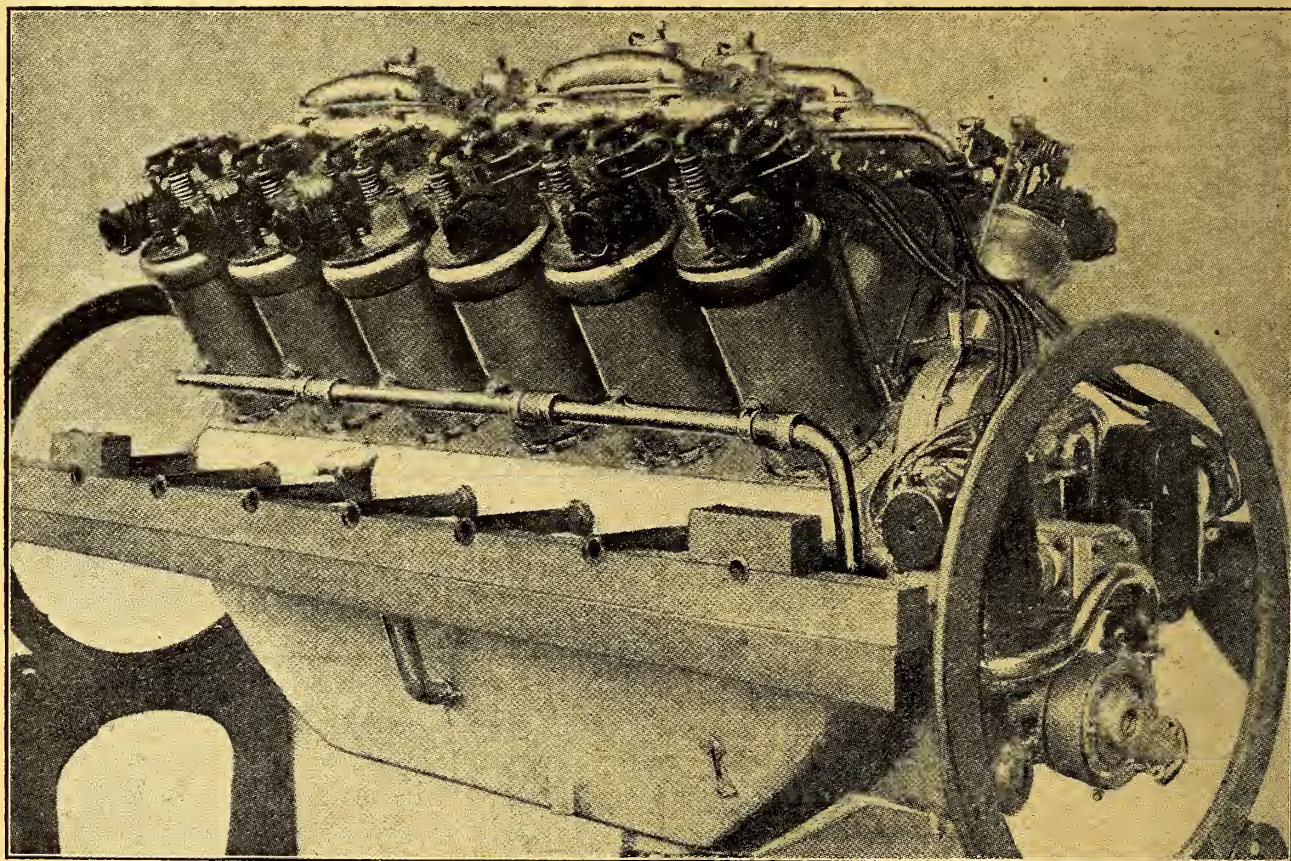
Pistons.—Aluminium alloy die castings. Two cast-iron eccentric rings.

Piston Pins.—Nickel steel heat-treated. Dried hollow, case-hardened and ground. Pin bearings direct on aluminium of piston bosses. Pins pressed in connecting-rods and held by locked set-screw.

Connecting-Rods.—Of the forked type made from chrome vanadium steel forgings machined all over. Eye-beam machined out from the solid.

Connecting-Rod Bearings.—Fahrig white metal, bronze-backed. Reamed to running clearance of exact size of crank-shaft. Bearing held in fork rod and rotating in single end rod.

Crank-shaft.—Heat-treated chrome vanadium forging, finished all over and drilled hollow. Six throw, seven main bearings. All bearings ground. End of shaft splined, tapered and threaded



General View of the 12-Cylinder 250-h.p. Curtiss Motor.

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Crank-case.—Aluminium alloy casting. Seven motor support tubes, lower half bolted on.

Timing gears.—Helical teeth type. Crank-shaft gear steel forging pressed in and keyed to shaft. Half-time gear special manganese bronze, keyed on cam-shaft and held with retaining-nut locked to gear.

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Mr. C. W. Brett, of Barimar, Ltd., sends the following interesting letter concerning after-the-war problems, which should be of material interest to the Aircraft Industry:—

"Germany's intention to obtain an initial advantage in the fight for the world's trade is plainly seen in the social and economic reconstruction that has been proceeding throughout the Fatherland side by side with the country's gigantic efforts on all the war fronts. In nothing is this idea of Germany more plainly seen than in the latest scheme announced, by which the great armament firm of Krupp, with its scores of thousands of mechanics, is to be linked up with the North German Lloyd Steamship lines. The Essen firm has now purchased an interest in the steamship company, and one of its directors is to have a seat on the board.

"When war broke out, official Germany had so organised its machine shops that only the pressure of a button was required to switch all the works on to munition making. All that is happening now shows that at the psychological moment the same procedure will be adopted, with this difference—German machinery will make wares for the world's marts instead of munitions for the Fatherland.

"The adroit move of Krupp and the steamship company is not a mere private commercial transaction. It has a much wider significance of which we, in this country, should take due note. While Teuton submarines have been busily engaged sending to the bottom as many British ships as possible, existing German craft have been safely interned in home or neutral ports. Meanwhile, German shipbuilders have been steadily building new vessels for the mercantile marine, some of them of 20,000 tonnage.

"It is Germany's ambition to emerge from the war, even if beaten, as the first shipping power in the world, and the new link forged between Essen works and Bremen ships is another move in a well-matured plan to realise this aim.

"The question naturally arises in one's mind whether we, as a nation, shall once more be caught napping. The British Government has had to be whipped into action in many directions, and even to-day it seems next to impossible to close up German businesses in Great Britain long since marked down for extinction. How far positive progress has been made by any of the Government Committees appointed to consider questions of after-the-war trade it is impossible to say, since not one of the Committees has issued a report. Months ago there was noticeable activity in certain industries, chiefly in the formation of trade associations, but this seems to have died down.

"Wise men judge the future by the past, and, adopting this formula, we shall probably find that British trades and industries will progress and flourish just in proportion as they concentrate their energies now upon perfecting their organisations and co-operating in a commercial campaign conducted in every corner of the world. In a word, our industries will rise or fall according to the wisdom and the extent of the efforts of their organisers.

"So far as the motor engineering industry is concerned, we feel that it will require a far more powerful effort than has yet been put forth if it is to cut a creditable figure in the impending trade war, and anything that the Government can do to strengthen the position will be heartily welcomed.

"Yours truly,

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[The S.B.A.C. should lay this lesson to heart also.—Ed.]

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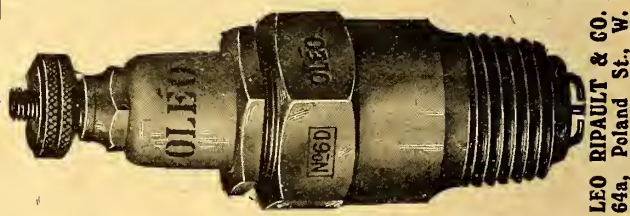
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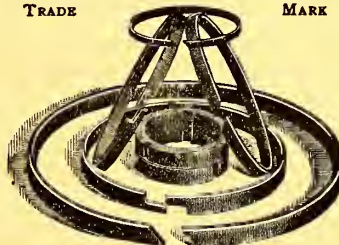
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
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ON A PARABLE OF CENTRALISATION.

An inspired infant once defined a parable as a heavenly story with no earthly meaning. Here, then is a parable of the Wild West which somehow seems to me to fit the much-discussed question of the centralisation of aircraft supply, though, perhaps, it may have no meaning for those who having eyes see not.

A certain unwise man came out of the East, and, journeying in the Western States of America, came to a "city," where he entered into the only inn and desired food. He sat him down at a table, and, finding thereon a well-thumbed and dirty but highly elaborate menu-card, called the waiter to him and said, "Waiter, I guess I'll have some *hors d'œuvres* to start with, and then a *bisque*, and then some *blanchailles*, and then a *tournedos*, and then a bird of some sorts, and after that we'll see about the rest."

The hired man departed into the house, and in a short while the sojourner, hearing a heavy step, turned round and found himself regarding the muzzle of a six-shooter, behind which was a large man of fierce countenance and high boots, who said to him, "Say, stranger! Permit me to interduce myself as the proprietor of this here hotel. *I guess you'll have hash.* And after that you won't see about nothin' more to eat, because it ain't to be had. That there mennoo is for the purpose of givin' tone to this here establishment, and it ain't intended for to make travellers sassy."

And the traveller had hash, and was well content therewith, being nourished and warmed thereby.

Now, when you come to think of it, especially in these days of war prices and official advice to hotel proprietors, there is something to be said for a good wholesome meal of hash, as against inefficiently produced kickshaws from a number of separate culinary departments run by people who frequently know nothing about their jobs, and are mainly concerned with glorifying themselves at the expense of the other departments.

I do not say that I should appreciate a perpetual diet of hash, even though there were several varieties of hashes produced from the same kitchen, but it might be the most efficient way of using the material and labour available for the well-being of the consumer. Therefore I suggest that the principle be given serious consideration.

GETTING RESULTS.

The interpretation of this parable bears on the problem of getting the best aeroplanes for our flying officers and men at the front from the present available supply of labour and material. At the moment the "experts" of the R.N.A.S. and of the R.F.C. are all having aeroplanes constructed to their own pet ideas by various manufacturers. Some of the said "experts" have hardly even been to see the war, and know nothing of active-service requirements. Others have not flown on active service for many months, and their ideas are entirely out of date. Others were never good enough fliers

themselves to judge what is and what is not an active-service machine. And others again, who, though not pilots, are concerned with aircraft production, are mentally incapable of comprehending what is required of an active-service aeroplane.

The result is, especially in the R.N.A.S., that large numbers of machines are turned out which are not only useless for war purposes, but dangerous, because they are used on active service for lack of something better.

The inefficiency of the R.N.A.S. in this particular respect is increased by the fact that there is no proper department whose duty it should be to interview all active-service officers returning on leave, to collect and tabulate their opinions and experiences of different machines and engines, and to transmit the result to the design and construction departments. I do not know whether the R.F.C. has such a department, but it certainly should have.

GETTING AT THE TRUTH.

Lengthy reports in official language composed at the front, and percolating slowly through innumerable departments at home, can never have the same effect as a heart-to-heart talk between the user and the supplier.

If a report reads, "Submitted that this type of machine is inadequately engined, and is slow in answering its controls," it cannot have the same effect as a war-weary pilot who announces to the machine's official sponsor that "the damned engine can't be trusted for half an hour, and that the blasted old 'bus steers like a dray!"—and further language of a more lurid kind.

It has been reported of certain machines officially that they are not so fast as is desirable, but that they are capable of lifting great loads, and can be used for raiding at night. An active-service officer's verbal description, heavily bowdlerised, is that they are useless aerial tanks: they lift a fair weight when they are new, and go out of shape after two or three bumpy landings, so that they never lift decently again: they are so slow that, when a searchlight picks them up, it holds them easily, and they can be shot down like rabbits: they are so unhandy that they cannot dodge searchlights or guns: and it is impossible to fight out of them.

For what it is worth, I am told that the Navy, in the spirit of fraternal love fostered by Lord Curzon and the Air Board, have handed a number of these machines over to the R.F.C., who, being free from financial interference, take the engines out and use them as spares in their own machines, and then burn the aeroplanes.

One cannot blame the R.F.C. for these cremations, for the machines are useless to them and only take up room. But why were the machines ever ordered? And why have not the officers or civilian officials at the Admiralty who have been responsible for this kind of mistake continuously since the outbreak of war been sent to sea, out of the R.N.A.S. altogether, or dismissed and pushed into

the ranks in the Army, where they might do some good and could not, at any rate, do any more harm?

As things are, some of our officers and officials, when asked hereafter, in the language of the official poster, "What did you do in the great war, daddy?" will be compelled to reply, "As an official of the Design Department I prevented a lot of perfectly good material from becoming efficient aeroplanes, and so stopped our rivals of the opposite Service from grabbing too much credit."

CENTRAL CONTROL OF SUPPLY.

Now, it is perfectly obvious that such waste of labour and material cannot be allowed to continue, and that some centralised control of supply must be introduced.

There are various ways in which such central control can be achieved. One way is for the Air Board to be given executive power so far as supplies are concerned. This would seem reasonable enough if the Board had showed more strength and unanimity in the past. But it is open to the objection that, with Naval and Military representatives on the Board, it would be difficult to obtain unanimity on anything. And, moreover, it would merely introduce into the labour and material market a third purchasing power in competition with the Navy and Army proper.

Yet another suggestion, which seems to find favour in some quarters, is that the purchasing departments for both Services should be centralised at Adastral House and placed under the R.F.C., in which case the R.N.A.S. would presumably get what it could beg in the way of supplies. One objection to this plan is that, even after giving full credit to the good work done at Adastral House under the post-agitation regime, the weakest spot in the R.F.C. is still its supply department. The R.F.C.'s choice of machines leaves little to be desired, but much might be done to improve the system of purchase and inspection—especially the latter—and generally to speed up output.

One can scarcely expect soldiers to excel in such a mere commercial thing as output. Nor are they likely to be much assisted in their efforts by gentlemen of the University professorial type, nor by ex-motor-car dealers, neither of which classes have had actual experience of output in factories.

It has been advanced as an argument against centralisation, on either these or any other systems, that persistent gossip at the Admiralty insists that certain of their lordships intend to resign if the supply of R.N.A.S. aircraft be taken out of the hands of the Admiralty. It has been officially denied in Parliament that any such intention has been expressed by their lordships, but the lack of expression does not deny the intention. If such, indeed, be their intention, one can conceive of no stronger argument in favour of centralisation.

WHERE THE MINISTRY OF MUNITIONS COMES IN.

The third alternative seems to be that the Ministry of Munitions shall control supply. This suggestion has already been vigorously debated in both the Services and in the Aircraft Industry also. Like most great changes, it meets with more opposition than support, or, at any rate, the opposition is more vocal.

Personally I am without prejudice either way, only I want to see this country win the war, and any reasonable suggestion to that end seems worth discussing as impartially as may be.

First of all let it be clearly understood that there is no suggestion that the Ministry should interfere with design. Both Services would still have their designing departments, and aircraft manufacturers would be encouraged rather than hindered in producing new and improved aeroplanes and engines. But such centralisation would prevent home-staying officers and officials

from placing large orders for machines which had never passed their experimental stage, as has happened in both Services, notably in the cases of the "No. 1,000" type seaplanes, certain flying boats, and the R.E.7 biplanes; and thus much waste of labour and material would be prevented. The experimental machines would certainly be built, but they would not be duplicated till they had made good.

INDIRECT CONTROL.

Secondly, let it be equally clearly understood that the Ministry of Munitions already controls the output of aircraft indirectly, and in the very way least of all calculated to increase it. The marvel is that the existing control has not seriously hampered output.

It is necessary to remember that the Ministry controls all labour, all material, all tools, and all means of manufacture—for example, buildings, power, light, and so forth. Now, obviously, if the Shell Department or the Trench Warfare Department of the Ministry wants men or material or buildings in a certain place, and men, material, and buildings are wanted at the same place for aircraft work, it would only be human nature if the shell people and the trench people got them and the unsupported aircraft people did not.

One hears complaints in the Aircraft Industry that it is difficult to deal with the Ministry: that material is hung up: that the labour question is not handled so as to help aircraft production: and that Admiralty or War Office pressure has to be invoked to obtain necessary supplies. After all, is it not rather natural? No one in the Ministry is officially interested in aircraft production, and everyone is interested in something else.

Does it not seem equally natural that, if the Ministry had an Aircraft Department on an equal footing with the Shell and Trench Warfare Departments, that Department might be of very considerable assistance to the Aircraft Industry?

Every official in that Department would be personally interested in pushing on the output of aircraft, and would be doing his best to increase the supply of labour and material and to decrease the amount of useless work.

The Ministry is largely composed of men who have been successful as producers in their own businesses, and quite a large number of them want to win the war. They might say, with Mr. Kipling's "Married Men":

"We're all of 'us anxious to finish our bit,
An' we want to get 'ome to our tea!"

Very many of the more highly placed officials work without fee or reward, and their one object is to get things done, so that they can get back to their own businesses. Only, as I have said, none of them is officially interested in getting aircraft things done, which is not good for the output of aircraft.

There is, of course, the obvious objection that such officials know nothing about aircraft. Is that any drawback in actual fact? Many firms are making excellent aircraft to-day who made anything from steam-roundabouts to rabbit-hutches before the war. The duty of such officials would be to produce aircraft, not to design them or even to choose them, and active-service officers would soon tell them which designs were required and which were not.

SERVICE OPPOSITION.

Service opposition to an Aircraft Department in the Ministry is quite understandable. Officers who have had "cushy" jobs for months or years, ostensibly overseeing aircraft output, naturally do not want to lose their jobs or to become subordinate to civilian officials.

One does not imagine that the Master-General of the Ordnance and his assistants were overcome with joy when the Ministry of Munitions was formed and Mr. Lloyd George assumed control of gun and shell output. Yet

will anyone in the Army assert, with any prospect of being believed, that we should have reached our present output of munitions at this date if the control of output had been left to the War Office?

None would suggest that the Ministry has not made mistakes, but it is well to remember that the man who never makes mistakes never makes anything else, and that the man who rectifies his mistakes quickest is the one who produces most.

A SAMPLE ERROR.

When, as is its habit, the Air Department at the Admiralty makes a mistake, the effects of that mistake go on for months. For example, many months ago, a certain type of useless machine was ordered. After a number of them had been delivered, the people who were responsible for ordering them, and who had been heartily cursed for them by active-service pilots, endeavoured to improve their performance by altering certain fittings, and orders were sent to the squadrons that all these machines were to be so altered. Then the squadrons began to send in requisitions for those fittings to the proper department, which in turn ordered them from manufacturers, to the value of many thousands of pounds. And then, months later, when these fittings began to arrive, it was discovered that the whole series of these aeroplanes had been "deleted," and so all the fittings were wasted. Can one imagine a transaction of this kind occurring if the supply of aircraft material were properly centralised under a business head, and handled by business men who knew the meaning of the phrase "cut your losses"?

Experimental officers in both Services would probably find their experiments considerably expedited by a centralised and more efficiently produced supply of material, and the chief difference would be that a great deal of overlapping in inspection of material, and in what one might

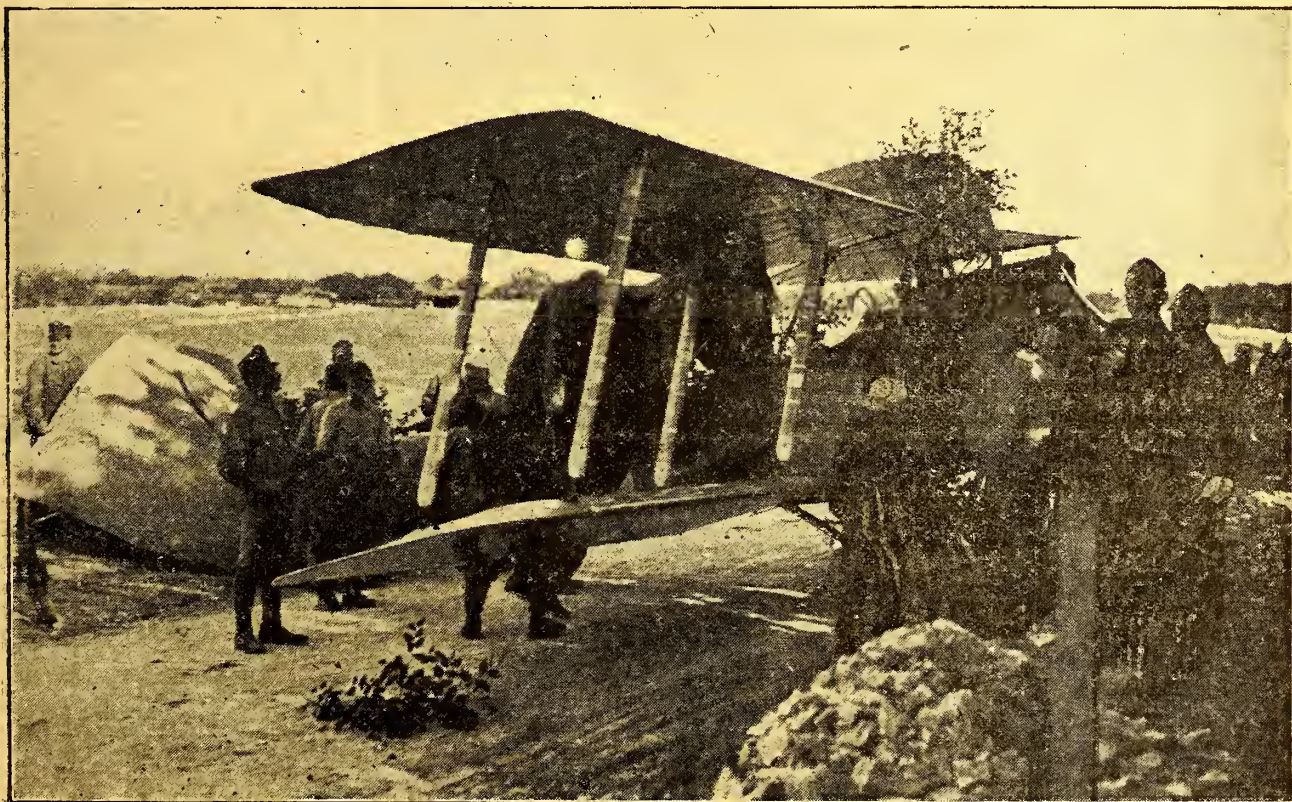
call the "commercial" departments, would cease, and a number of inspectors, viewers, examiners, clerks, and non-producers generally would be released for productive work, or for the Army. Also, a number of officers who are now employed in dealing with such work, and very often in merely preventing the opposite Service from commandeering material they want themselves, would be released for active service, or, at any rate, for more useful work at home.

PRACTICAL CONTROL.

Both the Services and the Industry may do well to recognise that fact that, if the Ministry of Munitions really wants to be unpleasant, it already holds practical control over output. Controlling labour, material, and means of production as it does, it can quietly put a pistol to their heads and say, "Guess you'll have hash," just when certain officers are ordering all sorts of luxuries in the way of fancy flying-boats or freak machines of various sorts, contrary to the wishes of active-service people who want simpler things which are better suited to their local needs.

The active-service officer is always at a disadvantage when he comes home and starts to complain about the things the people at Headquarters send him to fly. As a rule, he is of somewhat junior rank, and the mere fact of his being in uniform prevents him from speaking his mind to home-staying superiors who have risen rapidly by sticking closely to their desks—as advocated by the immortal Sir Joseph Porter, K.C.B. Yet the same officer would have no hesitation in telling a civilian official just what he thought of him and his machines.

One can sympathise with the two-striper R.N.A.S., or captain R.F.C., who, after a year or two of flying in the face of the enemy, finds his recommendations overborne by a man with superior rank-badges, but with far less practical experience of aircraft, with no active-service



An Austrian aeroplane being covered with branches to obscure its outline from enemy aviators.

experience at all, and very possibly his junior in the Service in actual time. And if that immediate superior disagrees with him, he can practically be prevented from carrying his experiences and his grievances to the experienced officers of high rank right at the top, who would be all the better for hearing them. There is no more deadly crime in the Services than "short-circuiting"—as it is called—from a junior to a senior officer, by cutting out the official lines of communication, and only those with strong personal influence can indulge in such a luxury.

It seems possible that with actual output under the control of business men, a good many such troubles might be removed. I do not dogmatise in this matter. I merely commend the whole subject to the consideration of those most likely to be affected by the ultimate result.

It has been officially stated in the House that a date is to be given for the discussion of the whole question

of Service aeronautics, but no indication has been given as to whether this matter of centralisation is to be settled by the Cabinet, or the War Council, before or after the promised debate. Possibly both events may have occurred before these notes appear in print.

In any case, the said notes may afford food for thought, both in the Services and in the Industry, for Parliament can always undo what Parliament has done, and the decisions of Cabinet meetings and War Councils are about as fixed as the form of a cloud and about as stable as a parasol monoplane.

There is much to be said for various forms of centralised control of output, but above all it is well to remember that the person who holds the sources of supply as well as the gun is the person who is best able to advise on the subject of the menu.

C. G. G.

QUESTIONS IN THE HOUSE OF LORDS.

On Nov. 21st, **Viscount Peel** asked whether the Government would amend their existing practice under which no compensation was payable from public funds for death or personal injury caused by the action of hostile aircraft or other enemy action. He submitted that the claims of civilians generally, and munition workers in particular, to receive compensation from the State ought to be considered.

Lord Hylton, in reply, said the matter was at present engaging the attention of the Government, but there were many difficult and complicated points connected with it that made it impossible for him to say anything more for the present.

QUESTIONS IN THE COMMONS.

On Nov. 21st, **Mr. Asquith**, replying to **Mr. Ashley** (Blackpool, U.), who asked whether he would give an early day for the discussion of the motion on the powers of the Air Board, said: Yes, Sir, facilities will certainly be given for this discussion, but I cannot yet name an exact date.

Mr. Ashley: May we have this question discussed before the decision of the War Committee, so that the House may express an opinion upon it? **Mr. Asquith**: I cannot promise that. The House will certainly have full opportunity of discussing the matter.

Mr. Pemberton-Billing (East Herts, Ind.): Will the right hon. gentleman say whether the operations of the Royal Naval Air Service are constantly being held up pending the decision of the Government? No reply was given.

On Nov. 22nd, **Mr. Joynson-Hicks** (Brentford, U.) asked the Parliamentary Secretary to the Admiralty whether he was aware that in the early part of the war one Lyman J. Seely, selling agent of an American aeroplane factory, informed his company that through the influence in London of an English barrister he would be able to get a large order for aeroplanes if he were allowed a commission of 15 per cent., as that was the usual rate for such business, in addition to the 1 per cent. which had up to that date been his previous rate for obtaining orders; and, if so, what steps he proposed to take. He also asked the right hon. gentleman whether he was aware that in certain large orders placed in America for the supply of aeroplanes there was added to the price a sum of 16 per cent., or one-sixth of the total order, amounting to some millions of dollars, for disbursements in England for securing the Admiralty order; and whether various payments on account of these commissions had been made by the vendors to a certain English barrister.

Dr. Macnamara (Camberwell, N., L.).—We are informed that the gentlemen referred to represented the company in this country, and were entitled to receive certain payments or commissions under the terms of the agreements between the company and themselves. The agreements, we learn, do not merely deal with agents' selling commissions, but with patent rights and other matters. During the course of an examination of accounts last July it appeared that payment of commissions to agents to the extent of 16 per cent. of the contract price was being made. We objected and asked for explanations, and further inquiries are proceeding in the States. I should add that in the matter of our inquiries the company is giving us every assistance. I do not wish to pre-judge the case one way or another, but it appears to be clear that the payments were made solely to the two persons referred to under the business agreements subsisting between them and their agents in this particular case.

In reply to a supplementary question, **Dr. Macnamara** said that there would be further inquiry. He declined to disclose the name of the barrister concerned pending the examination that was promised.

Mr. Butcher (York, U.) asked whether it would not be expedient to appoint a small Parliamentary Committee to inquire into Admiralty contracts of this kind, and **Dr. Macnamara** replied that the point would be submitted to the First Lord.

Mr. Pretymann, replying to **Mr. Fell** (Yarmouth, U.), said the question of whether any alteration should be made in the rates of premium in respect of damage by hostile aircraft was under consideration.

On Nov. 23rd **Mr. Ashley** (Lancashire, Blackpool, U.): Will the right hon. gentleman now say what day he is going to give for the discussion of the powers of the Air Board?

Mr. Asquith: I promised to give a day to it either next week or the week after.

Commander Wedgwood: When are we going to get a day for the discussion of man-power?

Mr. Asquith: At the earliest possible date. (Loud laughter.) **Mr. Hobhouse** (Bristol, E.): Shall we get the report of the Man-Power Board before that discussion? **Mr. Asquith**: I cannot promise that. **Mr. Hobhouse**: Does the right hon. gentleman not see the difficulty of discussing the question of man-power without having the report of the Man-Power Board?

Mr. Pemberton-Billing: Will the right honourable gentleman give an undertaking that the House will have an opportunity of discussing both the Man-Power Board and the Air Board before the holidays? **Mr. Asquith**: What is the object of asking that question? I have already given undertakings in regard to both these matters. Other members rising to continue the cross-examination of the Prime Minister, the **Speaker** ruled that members wanting further information should put questions on the paper. (Cheers.)

THE COMMISSION CHARGES.

It is with great regret that one records the charges of accepting commissions which have been alleged in the House of Commons against certain people concerned with our Flying Services. However, for a very long time it has been a common topic of conversation among those who know anything of the inside of aircraft matters that something of this nature has been going on, and it was quite time it was confirmed or refuted.

As the whole affair is *sub judice* one cannot at present discuss the true inwardness of it, but one may perhaps say that the chief sum involved is a matter of 16 per cent. on some £2,000,000, or in other words payments amounting to £320,000 in commissions. There may also be smaller sums concerned with separate deals altogether.

It is expected that the whole affair will be more or less public property within the next week, as apparently ample evidence is already in the hands of the people most concerned with putting things straight.

Of course it is most regrettable that the Flying Services should be mixed up in an unsavoury affair of this sort so early in their career, but the amount is probably trivial compared with the graft in other branches of equipment and supply. If only the forthcoming exposures remove from the path of progress some of those who have done so much to hinder the efficiency of the Flying Services in the past the *affaire* will be cheap at the price.—C. G. G.

THE QUESTION OF THE MOMENT.

One is told that if one wishes to become really popular with the Navy, especially with those who guard our South-Eastern shores, where the destroyer raids come from, one asks as innocently as possible, "Did you say 'airship' or 'warship'?" In case any readers may like to try the question on their Naval friends they will do well to note that it is advisable to possess a complete trench-warfare outfit as defence against the reply.

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THE DEATH OF SIR GEORGE WHITE.

All who have been at all closely concerned with the development of aviation in Great Britain must have felt deep regret last week on hearing that Sir George White, the founder of the Bristol Company, had died on the night of November 23rd. Sir George was a comparatively young man, considering how much he has done in the world, being only sixty-two years of age, and one might well have looked forward to at least another ten years of useful life for him, with many peaceful years of rest to follow, for he always looked fit and well, and seemed full of that boundless energy which had carved out so remarkable a career for him.

Beset as they are by self-advertising politicians, the people of this country know but little of the really big men who make their history for them, and do not talk about it. Sir George White was essentially a big man: big in his commercial ideas, big in his organising ability, and big in his foresight and faith in the future. In nothing but his physique was he anything but big, and physically, he was one of those short, wiry men, full of that curious dynamic force which does more by sheer will power than bigger men can do by brute strength.

Startling life without money or influence, he set out as a mere lad to earn his own living in Bristol, where he was born: and in Bristol he died, certainly the most powerful man in that city, and probably the greatest influence on British history that the city has ever produced. In him was reincarnated the spirit of the Bristol "merchant venturers" of old, who fought sternly and strenuously for what they won, and were generous sportsmen when they had won it.

Those who have been privileged, as I have been, to hear Sir George tell the tales of some of his early deals in tramways, and his fights with uncivilised obstructionists who opposed his schemes, and with those who tried to outdo him at his own game, must have recognised him as being of the same blood as those who commanded Bristol's fleets in the days of Good Queen Bess when they set forth to bring cargoes from the Indies, by trade if convenient, but to bring them in any case. Straight fighters, neither giving nor asking for advantage till the fight was over, and then good losers or generous conquerors were they, and of such was Sir George White.

From small beginnings the young George White rose to be secretary of the Bristol Tramway Company, and thence to be a director. Then his real ability had its chance. He foresaw before anyone else the future of electric traction, and he started out on a vast campaign for the electrification of tramways, buying up old ramshackle horse tramways all over the country and electrifying them, much to the advantage of the local population and to the profit of himself and his partners in his various deals.

Coventry, Bristol, and Dublin were among his ventures I know, for many a sleepless hour did his workmen cause me in those towns while they wrought all night long with roaring flare-lights and clanging hammers at the laying of the new rails: and I believe it would be hard to find an electric tram system in these islands with which Sir George White has not at some time been concerned in some way.

But despite his pioneering of electric traction, Sir George was far from wedded to electricity, for he was one of the first to see the possibilities of the petrol motor. As absolute dictator where public conveyances in Bristol were concerned, he might, if he had been a smaller man, have tried to force everybody to use his trams by depreciating the quality of the Bristol cab and 'bus services: but, being what he was, he gave Bristol the best taxi-cabs in the world.

While Londoners were still using asthmatic two-cylinder Renaults, Bristolians revelled in high-powered Charron taxis, which were maintained in a high state of efficiency, as well I know, having navigated down precipitous Park Street on one of them with twelve able-bodied men aboard, after one of Sir George's entertainments to the Bristol Aero Club. And he supplied motor-buses which climbed the said Park Street with full load of passengers. They were unlovely to look at, and slow of movement, but they moved as unfalteringly as one of Sir George's own schemes to capture a tramway system.

Just when he became interested in aviation I cannot say, but I imagine it must have been about the time of the great Reims meeting of 1909, for it was in the early days of 1910 that the British and Colonial Aeroplane Co., Ltd., the pioneer of all big aircraft concerns, was formed, and when the firm exhibited at Olympia a Zodiac biplane. This was in the charge of Mr. Sidney Smith (now Lt.-Col. R.F.C.), one of Sir George's nephews, and of one Collins Pizey (late of the Bristol Tramway Co., and afterwards one of the world's finest pilots, and perhaps the finest instructor ever known, who died last year as a *Capitaine de Frégate* in the Greek Navy). Sir George's only son Mr. Stanley White, who succeeds to the baronetcy, was the managing director of the new concern, and Mr. White Smith, Mr. Sidney Smith's brother, now chairman of the great Society of British Aircraft Constructors, was secretary. With them was Mr. Herbert Thomas, a nephew of Lady White, and now ably managing the firm's immense works at Bristol.

One can give here but a brief sketch of the firm's career, which suffered many vicissitudes, thanks to this country's lack of interest in aviation, but through it all Sir George, with his great foresight and his implicit faith in his own judgment, stood by it financially, and never has there been the slightest doubt about the soundness of the firm's credit.

At first the firm was content to build the old familiar "Bristol box-kites," which were practically 1910 type Farmans, and some of them were still in use for school work after the outbreak of war in 1914.

Determined to do everything in a big way, the firm opened schools of flying, first at Lark Hill, on Salisbury Plain, and later at Brooklands, and the early days of those schools were indeed the Augustan Age of aviation. It was there that the great pilots of later days, and the leaders of modern aeronautics, learned their flying. When one recalls the names of those who were given their first real chance as pilots or instructors at the Bristol schools, one begins to realise how much aviation owes to Sir George White. Take a few famous names at random—Captain Dickson, Captain Wood, A. R. Low, Collins Pizey, Henry Fleming, Graham Gilmour, Harry Busted, Harold Barnwell, Henry Jullerot, Eric Harrison, W. J. Stutt, S. V. Sippe, F. W. Merriman, E. Hotchkiss, Gordon England, Howard Pixton, and Archibald Knight, all of whom were in their day in the front rank of pilots, and piloting Bristols. A list of the people they in turn taught would fill a book. Half the pre-war R.F.C. at least learned on Bristols, from General Henderson and General Brancker downwards, and nearly as big a proportion of the R.N.A.S.

Those were the days when men learned all there was to know about flying, and were not rushed through for their "tickets" on a dual-controlled pilot-factory. The finest French pilots, men like Tabuteau, Tétard, Prier, were brought over to fly Bristols. Expensive experiments were tried. All sorts of designers and designs were given a fair trial.

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Money was spent in hundreds of thousands, for, despite every discouragement from the War Office, and little enough encouragement from the Admiralty, Sir George backed his faith in the future of aviation, and backed it heavily. Mr. Farnall Thurstan, now Flight-Commander R.N.A.S., was sent to all foreign Powers as Ambassador-Extraordinary for the Bristol Co. In Spain, Italy, Germany, Austria, and Roumania he set up commercial relations with the military authorities at a time when the British authorities alone remained blind to the needs for a strong and healthy Aircraft Industry.

Though our War Office ordered only copies of its own official designs, Sir George encouraged the Bristol Co. to keep on experimenting with new designs, and so the firm had M. Coanda's and Mr. England's interesting and progressive types of aeroplanes, and finally, just before the war, there arrived the Bristol "bullet," designed by Mr. F. S. Barnwell (now Capt. R.F.C.) in conjunction with Mr. Harry Busteed (now Acting Squadron-Commander R.N.A.S.), the little, fast biplane which did more than anything else in the first two or three months of war to establish that "marked superiority" over the enemy to which Sir John French, as he then was, drew attention in his first dispatch of the war.

Meantime the firm's factory at Filton, near Bristol, continued to grow slowly but surely, and "finished like a Bristol" indicated then, as now, the highest possible mark of workmanship. Sir George would have nothing but the best, and his son and nephews carried out his wishes faithfully.

To-day the Bristol factory is one of the biggest, if not quite the biggest, in Great Britain, and its output is doing much to help our aviators to maintain their hard-won superiority in the air. To Sir George White's foresight, energy, and pertinacity this is due, and when the great aeronautical history of the world comes to be written his name will hold a foremost place among those who made Britain's command of the air a possibility. As a pioneer of locomotion, and as one of those who helped to build and maintain the Empire, his name will live for ever.

Lady White, his helpmeet in his early struggles and his close companion in his success, died in the early part of this year, and her death affected Sir George very deeply—so much so, in fact, that his own end was undoubtedly hastened thereby.

To his son, Sir Stanley White, and to his nephews, all will offer their sincere sympathy in the great loss which they and the nation at large have suffered.

C. G. G.

THE DEATH OF SIR HIRAM MAXIM.

Sir Hiram Maxim, the inventor of the first successful automatic machine-gun, died on Nov. 24th at his residence at Streatham. He was born in 1840 at Sangerville, Maine, U.S.A., and was French by descent, American by birth, and British by naturalisation. The Gardner, Gatling, Nordenfeldt, and Hotchkiss antedated the Maxim as machine-guns, but they were not automatic, their firing mechanism being hand-operated, whereas the Maxim used the recoil of one cartridge to eject its empty case, to load the next cartridge into the breech chamber, and fire it.

Maxim introduced his gun into England in 1884, and it was adopted by the British Army in 1889, and by the Navy in 1892. He also invented, as the result of a suggestion by Lord Wolseley, a smokeless powder for use with his gun.

The Maxim Gun Company amalgamated with the Nordenfeldt Company in 1888, and the combination was taken over by the Vickers Co. in 1896, the firm changing its name in 1897 to Vickers, Sons, and Maxim, Ltd. In 1911 the firm changed to Vickers, Ltd., and the new and much improved guns, which are proving so successful in this war, are known simply as Vickers guns.

Before coming to Europe, in 1881, Maxim had already invented such varied things as mouse-traps, automatic gas generators, automatic sprinkler fire extinguishers, automatic steam pumps, vacuum pumps, gas engines, electric lamps, and sundry other apparatus. He was knighted in 1901.

Maxim's first effort at a flying machine was a helicopter—or direct-lift screw machine—designed in 1872. He began his aeroplane experiments in 1880, and having no internal combustion engines at that date sufficiently light for the job, he designed a special steam engine, or, rather, a pair of compound engines which weighed 600 lbs., for 362-h.p. A water-tube boiler to match weighed 1,000 lbs., so the whole power-plant came out at less than 4½ lbs. per h.p. Steam enthusiasts will do well to note, however, that this weight does not include water or fuel.

The aeroplane itself was a huge affair, weighing a couple of tons, and was a kind of tandem biplane, built chiefly of steel tube.

The machine was erected at Maxim's residence, Baldwin's Park, Bexley. It was designed to run along a railway track, 9 ft. wide and 1,800 ft. long, above which was a second "safety" track to prevent the machine from rising too far off the ground.

In experiments made in 1894 the wheels all engaged the safety track after running a few hundred feet, thus proving that the machine was lifting itself, but about halfway along the track a rear outrigger carrying one of the wheels crumpled up, and a little farther on a leading wheel broke clean through the track, which was of pine 3 in. by 9 in., and a considerable crash resulted. The breaking of the track proved, however, that the machine had a marvellous lift.

Maxim's experiments were of an eminently practical nature, and his book, "Artificial and Natural Flight," describing his work, published in 1908, is well worth reading even to-day, for it shows how near he got to modern ideas in wing curves. If he had been able to go on with these experiments he would doubtless have influenced the development of aviation considerably, but the necessary financial resources were not forthcoming. Some small experiments were made by him at Crayford about 1910 in building a biplane of normal size, with Dr. A. P. Thurston, of the East London College—now R.F.C.—as assistant, but they were abandoned without a flight being achieved. Consequently, his aeronautical work is of purely historical interest.

An attempt was made in 1910 or so to use his name to advantage in the flotation of a company which, if one's memory serves, was called Blériot, Grahame-White, and Maxim, Ltd., all three names being in those days considerably before the public, but the public did not agree with the promoters as to the desirability of the proposed investment, and nothing further developed.

Thereafter, Sir Hiram had little or no connection with aeronautical affairs, and devoted his later days to inventing articles chiefly of domestic interest. He had a most ingenious and practical mind, and an eloquent and persuasive tongue; also he was a very hard worker, so he thoroughly deserved the success which he achieved.—C. G. G.

AIR INSURANCE.

With the approval of the Board of Trade the War Risks Advisory Committee have agreed to the following more comprehensive clause being substituted for the "Institute" Craft Clause No. 6 hitherto included in the Government policy:—

It is agreed to extend the protection of this policy, including risks of aircraft, to goods whilst in craft during the ordinary course of transit within the limits of the port of loading or discharge, the risk on goods arriving for transhipment on a further voyage not hereby insured to cease on their discharge into transshipping craft or on delivery on the quay, as the case may be.

Now the position is that so long as the goods insured under the Government War Risks (Cargo) Policy are in water transit between warehouse or depot and ship, or vice versa, the policy will cover them. If they be landed during such transit, then the War Risks (Cargo) Policy will cease to cover them whilst

they are on the quay, and they will, if insured under a Government Aircraft Policy, come under the protection of that policy, reverting to the protection of the War Risks (Cargo) Policy on being again put into craft.

The clause set out above is held to apply to current as well as to future insurance, and no endorsement will be required on certificates of insurance.

THE AIR BOARD.

It is understood that the Government came to a decision on Nov. 25th on the demand for more extended powers for the Air Board. In the circumstances it is expected that the Prime Minister will give a day this week, either to-day, Wednesday, or Thursday, for a full debate on the questions at issue. The matter will be raised on the motion of the Parliamentary Air Committee, which now stands in the name of 55 members.

It is announced that Lord Curzon's public meeting at Liverpool has been fixed for Dec. 12th.

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From the "London Gazette," Nov. 21st, 1916.

ADMIRALTY, Nov. 16th.

Temp. Act. Flt. Lt. to be temp. Flt. Lt.:—A. S. Goodwin, Aug. 5th, 1915.

WAR OFFICE, Nov. 21st.

REGULAR FORCES.—MEMORANDA.—The undermentioned to be temp. hon. Lts. whilst empld. as Asst. Insps., A.I.D. Aug. 26th, 1916: Thomas Bensley Ringwood, George Ramage.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) confirmed in their rank:—R. G. Watts, S. F. Feast, T. M. Wilson, A. E. Blackmore, J. J. Scaramanga, G. Barfoot-Saunt, J. D. V. Holmes, G. Dennison, L. B. Crough.

To be Sec. Lts. (on prob.):—R. F. P. Hocker, Oct. 19th. R. A. W. Collet, Oct. 30th.

TERRITORIAL FORCE.—INFANTRY.—R. SCOTS.—Sec. Lt. W. W. Cowan is secd. for duty with the R.F.C., Oct. 24th.

ARMY SERVICE CORPS.—S. WALES MTD. BRIG.—Sec. Lt. (temp. Lt.) O. E. Ridewood is now secd. for duty with R.F.C., Oct. 29th.

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From the "London Gazette" Supplement, Nov. 22nd, 1916.

WAR OFFICE, Nov. 22nd.

REGULAR FORCES.—ROYAL REGIMENT OF ARTILLERY.—R.H. and R.F.A.—Lt. E. C. Harrison, T.F., to be acting Capt. whilst comdg. an Anti-Aircraft Batt., July 2nd, 1916.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—J. R. McDonnell, G. Urquhart, J. D. Smith, E. E. Moodey, C. E. Oxendale, F. Jewell, H. Haycock, B. W. Pitt, W. W. Hall, H. L. U. Clark.

Officers of the Australian Imperial Force to be Sec. Lts. (on prob.):—Capt. H. A. Hammersley, Lts. G. A. Mitchell, C. R. J. Thompson, S. P. Ashton, H. J. Lane, L. R. Bradbury, H. N. S. Skeffington, J. C. Foden, W. R. Keast, H. D. Luxton, T. L. Gitsam, Oct. 23rd. G. W. Foreman, Oct. 24th. W. W. Vick, Oct. 30th. Sec. Lts. R. S. Phelan, A. D'A. Sutherland, P. E. Scrivener, A. Burns, A. S. Shepherd, H. Ross, Oct. 23rd. J. G. Wilson to be Sec. Lt. (on prob.), Nov. 13th.

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From the "London Gazette" Supplement, Nov. 23rd, 1916.

WAR OFFICE, Nov. 23rd.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Sqn. Comdrs.—From Flt. Comdrs., and to be temp. Majors whilst so empld.:—Capt. H. Petre, M.C., Commonwealth Mil. Forces; Capt. B. E. Smythies, R.E.; Capt. E. M. Murray, M.C., Queen Victoria's Own Corps of Guides, Ind. Army; Lt. (temp. Capt.) W. B. Hargrave, Suff. R., T.F.; Capt. the Hon. L. J. E. Twistleton-Wykeham-Fiennes, Oxf. and Bucks L.I., and to be secd., temp. Capt. B. P. Greenwood, Gen. List; Lt. (temp. Capt.) W. S. Douglas, M.C., R.F.A., Spec. Res.; Lt. (temp. Capt.) K. K. Horn, Spec. Res.; Lt. (temp. Capt.) R. Egerton, M.C., R. Ir. Fus.; Lt. (temp. Capt.) H. MacD. O'Malley, Spec. Res., Nov. 1st.

Flt. Comdrs.—Maj. O. M. Conran, R. Lanc. R., Nov. 1st. From Flying Officers and to be temp. Capt. whilst so empld.:—Temp. Lt. G. H. Walker, Gen. List, Oct. 12th. Temp. Sec. Lt. S. F. Browning, Gen. List, Oct. 17th. Sec. Lt. P. C. Garratt, Spec. Res., Oct. 21st. Sec. Lt. W. A. C. Morgan, M.C., Welsh R., Oct. 30th. Temp. Lt. F. L. Robinson, M.C., Gen. List; Lt. P. A. O. Peask, R. Ir. Rif., Nov. 1st. Sec. Lt. (temp. Lt.) T. A. Tillard, Norf. Yeo., T.F.; Sec. Lt. C. S. Duffus, M.C., Spec. Res., Nov. 3rd. Sec. Lt. C. B. Bond, Middx. R., Spec. Res., Nov. 6th. Temp. Sec. Lt. L. O. Crowther, Gen. List; Sec. Lt. H. B. Prior, Spec. Res., Nov. 8th. Temp. Lt. H. J. Payn, R.E., Spec. Res.; Sec. Lt. (on prob.) (temp. Lt.) T. R. Irons, York and Lanc. R., Spec. Res.; temp. Sec. Lt. W. Sowrey, Gen. List; Sec. Lt. R. H. Jarvis, Spec. Res., Nov. 10th. Sec. Lt. (temp. Lt.) F. R. Hardie, 3rd Hrs., Nov. 14th.

Flying Officers.—Temp. Lt. F. L. Robinson, M.C., Gen. List, from a Flying Officer (Observer) (Oct. 31st, but with seny. from June 8th. Temp. Lt. A. E. Illingworth, Northd. Fus., and to be transfd. to Gen. List; temp. Lt. B. S. Cole, Glouc. R., and to be transfd. to Gen. List; Sec. Lt. B. W. Pitt, Spec. Res.; temp. Sec. Lt. D. E. Davies, Gen. List, Nov. 2nd. Temp. Sec. Lt. H. Butler, York. R., and to be transfd. to Gen. List; Maj. A. S. W. Dore, Worc. R., T.F.; Sec. Lt. F. L. Carter, E. Surr. R., and to be secd.; temp. Sec. Lt. H. O. W. Hill, Gen. List; Sec. Lt. J. J. Scaramanga, Spec. Res.; temp. Sec. Lt. R. Hopper, Gen. List, Nov. 3rd.

Adjut.—Temp. Lt. R. Addenbrooke-Prout, R.A., and to be transfd. to Gen. List, Nov. 13th.

Equipment Officer, 2nd Cl.—Sec. Lt. (temp. Lt.) H. F. Anns, Lond. R., T.F., from a Staff Lt. at the War Office, and to retain his temp. rank whilst so empld., Nov. 8th.

Equipment Officers, 3rd Cl.—Temp. Sec. Lt. H. G. Waterall, Gen. List, Sept. 8th. Sec. Lt. (temp. Capt.) C. Ingram, Kent

Cyclist Bn., T.F.; Sec. Lt. (on prob.) H. E. Jarman, Spec. Res., Oct. 12th. Temp. Sec. Lt. G. B. Monkman, Manch. R., and to be transfd. to Gen. List; temp. Sec. Lt. C. S. Edwards, Gen. List; Sec. Lt. (on prob.) E. Butler, Spec. Res.; Sec. Lt. (on prob.) W. T. Davis, Spec. Res.; Sec. Lt. L. B. Crough, Spec. Res.; Sec. Lt. H. H. Greig, Res. of Officers; temp. Sec. Lt. (on prob.) A. W. H. Phillips, Worc. R., and to be transfd. to Gen. List; Sec. Lt. G. D. Harrison, Spec. Res.; temp. Sec. Lts.; Gen. List: M. P. Mullery, N. Glover, R. J. Muxworthy, Sec. Lt. J. H. B. Foss, Spec. Res. Sec. Lts. Spec. Res.: W. W. Hall, F. Jewell, E. E. Moodey, C. E. Oxendale, temp. Sec. Lt. (on prob.) E. H. Hooper, Gen. List, Oct. 31st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) resign their commns., Nov. 24th, 1916: E. D. Abbott, W. L. Alison, W. C. Matthews.

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The King has approved of the following Honour for Distinguished Service in the Field, with effect from June 3rd, 1916:—

DISTINGUISHED SERVICE ORDER.

Capt. (temp. Lt.-Col.) WILFRID RHODES FREEMAN, M.C., Manch. R. and R.F.C.

* * *

From the "London Gazette," Nov. 24th, 1916.

WAR OFFICE, Nov. 24th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers (Observers).—Temp. Lt. D. H. Scott, M.C., Army Cyclist Corps, and to be transfd. to Gen. List, Oct. 18th. Lt. L. H. Jefferson, 11th Hrs., and to be secd., temp. Lt. F. R. C. Cobbold, Suff. R., and to be transfd. to Gen. List; Sec. Lt. H. M. Golding, Glouc. R., Spec. Res., and to be secd., Oct. 26th. Capt. G. M. Moore, R. Berks R., Spec. Res.; temp. Sec. Lt. G. A. P. Upston, Glouc. R., and to be transfd. to Gen. List; Sec. Lt. I. M. Harris, K. R. Rif. Co., Spec. Res.; temp. Sec. Lt. H. G. Ainsworth, Welsh R., and to be transfd. to Gen. List, Oct. 27th. Lt. W. B. Farrington, Notts and Derby R., Spec. Res., and to be secd.; Lt. W. G. Meggitt, Welsh R., Spec. Res., and to be secd.; Sec. Lt. J. E. MacLennan, Sco. Rif., and to be secd.; temp. Sec. Lt. A. W. Rowlands, A.S.C., and to be transfd. to Gen. List; temp. Sec. Lt. H. Scandrett, Norf. R., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) A. E. Godfrey, Gen. List, Oct. 28th.

Equipment Officers, 2nd Cl.—From Equipment Officers, 3rd Cl., and to be temp. Lts. whilst so empld.:—Sec. Lt. A. W. Cott, Spec. Res.; Sec. Lt. J. N. D. Heenan, Spec. Res., Nov. 1st.

MEMORANDA.—L. F. de Peyrecave to be temp. Lt. whilst empld. as Asst. Insp., A.I.D., Nov. 1st.

Sec. Lt. (on prob.) N. Goodwin, from R.F.C., Spec. Res., to be temp. Sec. Lt. on Gen. List for duty with R.F.C., Nov. 4th.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Cpl. T. Jones, from Lond. Elect. Engrs., R.E., T.F., Oct. 30th. L.-Cpl. F. J. Standerwick, from Lond. R., T.F., Nov. 13th.

Flt. Sgt. C. P. H. Gunyon, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with the Mil. Wing of that Corps, Nov. 4th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The appt. of Sec. Lt. (on prob.) G. T. Bridgewater, notified in "Gazette" of Sept. 26th., is antedated to Sept. 3rd.

The appt. of Sec. Lt. (on prob.) H. B. D. Grazebrook, notified in the "Gazette" of Oct. 7th., is antedated to Sept. 7th.

The appts. of the follg. Sec. Lts. (on prob.), notified in "Gazette" of Oct. 17th., are antedated as follows:—H. H. Leage, J. H. Fletcher, W. L. Shaw, A. Graham, Sept. 7th. J. F. B. Smith, Sept. 10th. W. H. G. Furnivall, Oct. 2nd.

The appt. of Sec. Lt. (on prob.) J. Paradise, notified in "Gazette" of Oct. 20th., is antedated to Sept. 7th.

The appt. of Sec. Lt. J. D. Campion, notified in "Gazette" of Oct. 23rd., is antedated to Sept. 7th.

Sec. Lt. (on prob.) G. T. Bridgewater is confirmed in his rank.

* * *

From the "London Gazette" Supplement, Nov. 25th, 1916.

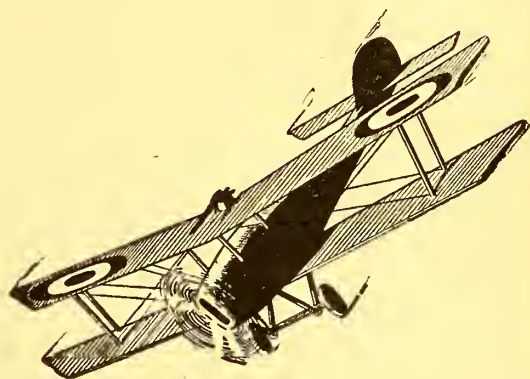
WAR OFFICE, Nov. 25th.

REGULAR FORCES.—The undermentioned N.C.Os. and men to be Sec. Lts. for service in the Field:—

MEMORANDA.—For duty with R.F.C.—Oct. 25th, 1916: Pte. Charles H. Bidmead, from A.S.C.; Pte. J. A. York, from Can. A.S.C.; and Dr. H. B. Griffiths, from Can. A.S.C. Oct. 26th, 1916: Sgt. Henry L. Pateman, from R.F.C.; 1st Cl. Air Mech. Ernest W. Dexter, from R.F.C.; and Pte. Leonard G. Banks, from Lond. R., T.F. Oct. 27th, 1916: Flt. Sgt. William F. Leech, from R.F.C.; Sgt. James R. W. Thompson, from R.F.C.; Sgt. Stanley Cockerell, from R.F.C.; Acting Sgt. Arthur Matthews, from A.O.C.; and Pte. C. J. Baylis, from Can. A.S.C.

ESTABLISHMENTS.—R.F.C.—Flt. Comdrs.—Maj. I. A. E. Edwards, R.A., from a Flying Officer (Nov. 1st). From Flying

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Officers, and to be temp. Capt. while so employed:—Lt. R. B. Mansell, Glouc. R., T.F.; temp. Sec. Lt. L. E. Brown, Gen. List; Lt. W. A. C. Heyman, 4th Hrs.; Lt. H. H. Balfour, K.R.R.; Spec. Res.; Lt. C. M. B. Chapman, M.C., E. Kent R.; Lt. R. C. Gallop, Sco. Rif.; Lt. H. S. Ward, Spec. Res.; Sec. Lt. (temp. Lt.) C. L. Bullock, Rif. Bdge., Spec. Res.; temp. Sec. Lt. C. E. Foggin, Gen. List; Sec. Lt. J. Stuart, R. Innis. Fus.; Sec. Lt. H. Fisher, Spec. Res. (Nov. 1st); temp. Lt. C. R. Cook, Gen. List (Nov. 10th).

Flying Officers.—Temp. Lt. W. P. Bowman, W. York R., and to be transf. to Gen. List (July 4th); temp. Sec. Lt. L. N. Graham, W. York R., and to be transf. to Gen. List (July 5th); temp. Capt. G. M. Bournemouth, attd. S. Lan. R. (Nov. 2nd); temp. Sec. Lt. (on prob.) W. H. N. Shakespeare, Gen. List; temp. Capt. H. E. Reynell, R. Highrs., and to be transf. to Gen. List; Sec. Lt. (temp. Lt.) W. P. Brown, Lovat's Scouts Yeo., T.F. (Nov. 3rd); temp. Sec. Lt. (on prob.) J. W. Foreman, Gen. List; temp. Sec. Lt. (on prob.) R. E. G. Fulljames, Gen. List (Nov. 4th); Sec. Lt. (on prob.) D. G. A. Allen, Dur. L.I., Spec. Res., from a Flying Officer (Observer) (Nov. 5th, but with seny. from April 1st); temp. Sec. Lt. A. D. Finney, Gen. List, from a Flying Officer (Observer), with seny. from Oct. 22nd, 1915; Sec. Lt. H. Haycock, Spec. Res. (Nov. 6th).

Equipment Officers, 2nd Cl.—From Equipment Officers, 3rd Cl.—Lt. S. A. Laird, Spec. Res. (Sept. 26th); Lt. D. C. James, Worc. R., Spec. Res.; Lt. M. D. McFarlane, Midd'x R., and to be sec'd.; Sec. Lt. E. McEvoy, Oxf. and Bucks. L.I., and to be temp. Lt. whilst so empld. (Nov. 1st); Capt. H. Le Jeune, Spec. Res. (Nov. 10th).

Equipment Officers, 3rd Cl.—Sec. Lts., Spec. Res.—J. D. Smith, J. R. McDonnell, Sec. Lt. (on prob.) P. R. Aitken, Spec. Res. (Nov. 3rd).

CAVALRY.—5th. LRS.—Sec. Lt. R. P. Harvey is sec'd. for empl. with R.F.C. (Oct. 3rd).

ROYAL REGT. OF ARTILLERY.—R.G.A.—Sec. Lt. H. I. Hardy, T.F., to be temp. Lt. whilst empld. with an Anti-Aircraft Bgde. (Nov. 8th) (substitute for notification of Nov. 7th).

MEMORANDUM.—Sec. Lt. (on prob.) T. H. Cooper, from R.F.C., Spec. Res., to be temp. Sec. Lt. (on prob.), Gen. List, for duty with R.F.C. (Nov. 5th).

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—E. P. Lyon, E. Butler, G. W. Longstaff. To be Sec. Lts. (on prob.):—M. J. Morris, N. R. Anderson, A. C. Atkey, C. S. Bellamy, H. B. Billings, J. W. Boulter, C. H. Cameron, J. G. Crang, C. M. De Rochie, M. A. Lavoie, G. I. D. Marks, S. W. Graham, M. G. Gunn, N. E. Kelk, R. H. Lloyd, W. G. M. Browne, L. B. Hyde-Pearson, B. A. Doran, B. J. Glynn, J. L. Fry, A. E. Watts, W. H. Weller, E. R. Tucker, U. H. Seguin, W. F. Willis, F. G. Reid (Oct. 19th); C. H. Sharpe (Nov. 4th).

TERRITORIAL FORCE.—INFANTRY.—R.F.A.—4th LOND. BGDE.—Sec. Lt. (temp. Capt.) H. G. Rickards is sec'd. for duty with the R.F.C.; Nov. 12th, 1916.

R. SCOTS.—Lt. J. G. S. C. Smith-Grant is sec'd. for duty with R.F.C. (Nov. 9th).

LIVERPOOL R.—Sec. Lt. C. F. Smith is sec'd. for duty with R.F.C. (Nov. 9th).

GLOUCESTER R.—Sec. Lt. (temp. Lt.) B. K. D. Robertson is sec'd. for duty with R.F.C. (Oct. 21st).

MANCHESTER R.—Sec. Lt. P. Ainsworth is sec'd. for duty with R.F.C. (Oct. 8th).

CORRECTION.—The following Officer was awarded the Military Cross in the "London Gazette" specified. His correct description is as now specified:—Temp. Sec. Lt. C. T. Cleaver, Gen. List and R.F.C. (Oct. 20th)

* * *

From the "London Gazette" Supplement, Nov. 25th, 1916.

The following has been awarded a second Bar to his Distinguished Service Order for a subsequent act of conspicuous gallantry:—

Sec. Lt. (temp. Capt.) ALBERT BALL, D.S.O., M.C., Notts and Derby R.—He attacked three hostile machines and brought one down, displaying great courage and skill. He has brought down eight hostile machines in a short period, and has forced many others to land.

(The D.S.O. and First Bar were awarded in "Gazette" dated Sept. 26th, 1916.)

The following has been awarded a Bar to his Distinguished Service Order for subsequent acts of conspicuous gallantry:—

Capt. STUART GRANT-DALTON, D.S.O., York R.—He attacked two hostile aeroplanes, although quite unsupported. Later, after being attacked by another enemy machine and wounded in three places, he brought his machine back and landed safely.

(The D.S.O. was awarded in "Gazette" dated July 27th, 1916.)

The King has been graciously pleased to confer the Military Cross on the following officers and warrant officers in recognition of their gallantry and devotion to duty in the field:—

Lt. (temp. Capt.) FREDERICK HOWARD JENKINS, R.F.C.—He flew 150 miles at night and bombed an enemy aerodrome, descend-

ing to 500 ft. under heavy fire. He has throughout done excellent work in reconnaissance.

Sec. Lt. (temp. Capt.) THOMAS MAXWELL-SCOTT, R.F.C.—He carried out artillery reconnaissances with great courage and determination. Later, diving to a low altitude, he attacked an enemy communication trench with his machine-gun.

Sec. Lt. (temp. Capt.) STEPHEN WILLIAM PRICE, R.F.C.—During a reconnaissance he was attacked by a large number of enemy machines. He manœuvred his machine with great skill, and fought down a hostile machine. On four previous occasions he and his pilot have accounted for enemy machines.

Temp. Sec. Lt. THEODORE JAMES WEST, R.F.C.—He attacked an enemy machine and brought it down, displaying great courage and ability.

The following have been awarded a Bar to their Military Cross for subsequent acts of conspicuous gallantry:—

Sec. Lt. ARCHIBALD STUART CHARLES MACLAREN, M.C., K.O. Sco. Bord.—He attacked and brought down an enemy machine from a height of 5,000 ft. He has on many previous occasions done very fine work. (M.C. awarded in "Gazette" dated July 27th, 1916.)

Lt. (temp. Capt.) FREDERICK FRANK MINCHIN, M.C., P.P.C.L.I.—He flew 150 miles at night to bomb an enemy aerodrome, descending to 500 ft., and doing serious damage. On another occasion he landed 45 miles from our line to pick up the pilot of a damaged machine in a hostile country. (M.C. awarded in "Gazette" dated May 31st, 1916.)

Sec. Lt. (temp. Capt.) AWDREY MORRIS VAUCOUR, M.C., R.F.A.—He attacked 10 hostile machines and completely scattered their formation. Previously, while returning with a perforated petrol tank, he shot down an enemy machine. Later, he shot down a hostile machine, being engaged with eight altogether. On another occasion he and his observer shot down two hostile machines. (M.C. awarded in "Gazette" dated Nov. 4th, 1915.)

* * *

From the "London Gazette" Supplement, Nov. 27th, 1916.

WAR OFFICE, Nov. 27th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Filt. Comdr.—Temp. Lt. A. M. Thom, M.C., Gen. List (Nov. 1st).

Flying Officers (Observers).—Temp. Sec. Lt. R. F. Power, R.A., to be transf. to Gen. List (Sept. 7th); Temp. Lt. G. F. C. Rawlings, R.A., and to be transf. to Gen. List (Oct. 6th); Lt. (temp. Capt.) F. W. Hudson, Norf. R., and to be sec'd.; Lt. H. St. Clair Smallwood, Ind. Army Res. of Officers; Sec. Lt. H. Richardson, Norf. R., and to be sec'd.; Sec. Lt. P. Ainsworth, Man. R., T.F. (Oct. 8th); Temp. Lt. H. J. L. Cappel, Gen. List; Temp. Sec. Lt. H. A. Pearson, R.A., and to be transf. to Gen. List; Sec. Lt. D. Clark, High. Bgde., R.F.A., T.F.; Sec. Lt. B. K. D. Robertson, Glouc. R., T.F. (Oct. 21st); Temp. Sec. Lt. C. T. Richards, R.A., and to be transf. to Gen. List (Oct. 24th); Sec. Lt. L. E. Dawson, 7th Australian Light Horse (Oct. 26th); Temp. Sec. Lt. (on prob.) C. W. Adkin, Gen. List (Nov. 1st); Sec. Lt. (temp. Lt.) A. M. Mitchell, A.S.C., and to be sec'd.; Temp. Sec. Lt. E. Roberts, Welsh R., and to be transf. to Gen. List (Nov. 2nd); Temp. Sec. Lt. R. Robertson, Gen. List; Temp. Lt. J. W. Mathews, A.S.C., and to be transf. to Gen. List; Temp. Lt. J. S. Dunkerley, Sco. Rif., and to be transf. to Gen. List; Temp. Sec. Lt. (on prob.) W. S. Wright, Leic. R., and to be transf. to Gen. List; Sec. Lt. H. Munden, Som. L.I., and to be sec'd.; Temp. Sec. Lt. P. C. Hollingsworth, Gen. List (Nov. 5th); Temp. Sec. Lt. G. F. Ward, Army Cyclist Corps, and to be transf. to Gen. List (Nov. 9th).

Special Appointment (Graded as a Park Comdr.).—Capt. Lord R. E. Innes-Ker, I. Gds., Spec. Res., from an Equipment Officer, 1st Cl., and to be temp. Maj. whilst so empld. (Nov. 8th).

Equipment Officer, 3rd Cl.—Temp. Sec. Lt. R. C. Fielder, Gen. List (Nov. 6th).

MEMORANDA.—Lt. G. A. Hoghton, R.N.V.R., to be temp. Sec. Lt. whilst empld. with R.F.C. (Aug. 21st).

Cdt. E. T. Driver, from R.A. Cdt. School, to be temp. Sec. Lt. for duty with R.F.C. (Sept. 11th).

1st. Cl. Air Mech. W. A. Andrews, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with the Mil. Wing of that Corps (Nov. 2nd).

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) T. M. Coates resigns his commn. (Nov. 28th).

TERRITORIAL FORCE.—R.E.—TYNE ELEC. ENGRS.—Sec. Lt. (temp. Lt.) H. S. Ripley is sec'd. for duty with R.F.C. (Oct. 23rd).

* * *

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Nov. 25th.

The following Officer had the honour of being received by the King this morning, when His Majesty invested him with the Insignia of Companion of the Order into which he had been admitted:—

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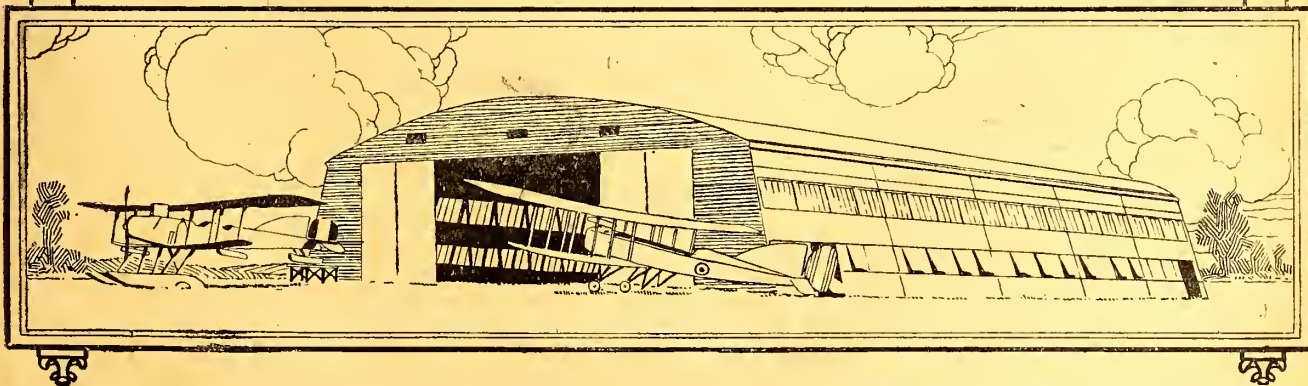
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NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Nov. 23rd.—Sub-Lts. (R.N.V.R.) (Temp.).—A. Howard and J. S. Hughes, both entered as Proby. Flt. Officers (temp.), seny. Nov. 26th; and apptd. to "President," addl., for R.N.A.S. (temp. commissions as Sub-Lieuts. terminated).

Mr. M. H. Findlay, entered as Proby. Flt. Officer (temp.), seny. Nov. 26th, and apptd. to "President," addl., for R.N.A.S.

Nov. 24th.—Surgn. (Temp.).—A. G. Holman, to "President," additional, for R.N.A.S.

The undermentioned have been entered as Proby. Flt. Officers (temp.), seny. Nov. 26th:—G. F. Moody (Cpl., R.M.L.I.), H. J. Horsey, D. H. Daly, D. R. B. Bentley, A. H. Paull, J. E. S. Alexander, A. G. Morris, R. Jarman, H. G. B. Linnell, A. E. Lettington, C. W. B. Colling, M. C. S. Bowley, L. L. Baldwin, and H. S. Holman.

Nov. 25th.—Lt. (Royal Sussex Regt.).—H. S. Broughall, M.C., entered at Prob. Flt. Officer (temp.), seny. Dec. 3rd.

Nov. 27th.—Flt. Commr.—C. R. Finch-Noyes, promoted to the rank of Squadron Commr., seny. June 30th.

OFFICIAL COMMUNIQUÉS.

Nov. 23rd.—During the course of yesterday afternoon (22nd inst.) an attack was carried out by British naval aeroplanes on the seaplane sheds at Zeebrugge and on the enemy's torpedo-boat destroyers lying alongside the mole.

Observers state that a destroyer was hit and damage was done to the sheds.

All our machines returned safely.

Chief Petty Officer Sydney Hudson, R.N.A.S., Wormwood Scrubs, was found guilty at Marylebone Police Court on Nov. 24th of driving an official motor-car along the Bayswater Road in a most reckless manner, and was fined £10. His driver's licence was also suspended for two months. One is sorry for the individual, but really some of the R.N.A.S. drivers do need a warning.

According to the American "Aerial Age" British aeroplanes are reported to be sweeping the Atlantic Ocean in search of German submarines attempting to cross the ocean.

According to reports the aeroplanes left Halifax for the vicinity which the Greek steamer "Patrie," reported being stopped by the raider.

[The report is unconfirmed, and may be mere moonshine, but at any rate it is a curious coincidence with the suggestion made in THE AEROPLANE a fortnight ago.—Ed.]

A special obituary note on Mr. Cedric Lee will be found on page 1060.

THE CASUALTY LIST.

Reported Nov. 24th.

KILLED.—Lee, Cedric, Sub-Lt., R.N.V.R.

Reported Nov. 27th.

KILLED.—Whetnall, Flight Sub-Lieut. Arthur J., R.N.

MISSING.—Hope, Flight Sub-Lieut. William H., R.N.

MILITARY.

G.H.Q. COMMUNIQUÉS.

Nov. 21st, 9 p.m.—Yesterday our aeroplanes co-operated successfully with our artillery. Two of our machines are missing.

Nov. 22nd, 9.25 p.m.—During the night of the 20th-21st our aeroplanes attacked enemy railway stations, billets, and transport with bombs and machine-gun fire. All our machines returned safely.

Nov. 23rd, 9.45 p.m.—Yesterday the enemy showed considerable enterprise in the air and crossed our line. Three of his aeroplanes fell into our hands, while a fourth was driven down on his own side of the line. One of our machines is missing.

Nov. 24th, 9.45 p.m.—Yesterday much successful work was accomplished by our aircraft. Twelve of our machines encountered an enemy formation of 20 aeroplanes, and as a result of the fight the hostile formation dispersed. One of the enemy machines was destroyed, and several others driven down damaged. All our own machines returned safely.

In other fights in the air four more of the enemy's aeroplanes were destroyed. Three of our machines are missing.

Nov. 25th.—9.45.—Yesterday, in spite of unfavourable conditions, our aircraft made reconnaissances and co-operated with the artillery. One of our machines has not returned.

Nov. 27th, 10.10 p.m.—Yesterday, in spite of the indifferent weather, our aeroplanes co-operated successfully with our artillery, and also bombed several points of military importance. Two of our machines are missing.

WAR OFFICE COMMUNIQUÉS.

The General Officer Commanding British Forces in Greece reports Nov. 24th:—On the Doiran front British aeroplanes successfully bombed and damaged the enemy lines.

The General Officer Commanding the British Forces in Greece reports:—Nov. 26th—On the Struma front our aeroplanes successfully bombed the enemy aerodrome at Drama.

HOME OFFICE COMMUNIQUÉS.

Nov. 28th, 12.20 a.m.—Hostile airships crossed the North-Eastern Coast last night.

Bombs are reported to have been dropped at several places in the Northern Counties, but no reports as to casualties or damage have as yet been received.

Nov. 28th, Midday.—A number of hostile airships approached the North-East Coast of England between ten and eleven last night.

Bombs were dropped on various places in Yorkshire and Durham, but the damage is believed to be slight.

One airship was attacked by an aeroplane of the Royal Flying Corps and brought down in flames in the sea off the coast of Durham at 11.45 p.m.

Another airship crossed into the North Midland Counties and dropped some bombs at various places.

On her return journey she was repeatedly attacked by aeroplanes of the Royal Flying Corps and by guns.

She appears to have been damaged, for the last part of her journey was made at very slow speed, and she was unable to reach the coast before day was breaking.

Near the Norfolk coast she apparently succeeded in effecting repairs, and, after passing through gunfire from the land defences, which claim to have made a hit, proceeded east at a high speed and at an altitude of over 8,000 feet, when she was attacked 9 miles out at sea by four machines of the Royal Naval Air Service, while gunfire was opened from an armed trawler, and the airship was brought down in flames at 6.45 a.m.

Full reports of casualties and damage have not yet been received, but they are believed to be slight.

The Home Command stated on November 28th:—

Between 11.50 a.m. and noon to-day six bombs were dropped on London by a hostile aeroplane, flying at a great height above the haze. Four persons were injured, one, a woman, seriously. The material damage is slight.

[The pilot at least deserves the thanks of the British nation for demonstrating the fact that aeroplane raids can be made on London. One hopes that the authorities will take due account of the warning.—Ed.]

The "Times" correspondent with British Headquarters reports on Nov. 25th as follows:—The enemy has made formidable efforts during the last few weeks to re-establish some sort of equality with us, but he has suffered very severely. You have heard briefly of the brilliant performance of our aviators yesterday, when 12 of our machines broke up an enemy formation of 20 and remained in absolute possession of the field. In that one engagement we lost not a machine.

On the day's fighting (Nov. 25th) as a whole we lost four, and we know that we definitely smashed eight enemy aeroplanes and sent several others down in a damaged condition. It was as successful a day in the air as we have had for some time, and the German must realise that he has still a long way to go before he can get supremacy overhead.

The R.F.C. has now been reopened for recruiting. No man in Medical Category A (general service) will be accepted unless he is a skilled tradesman. Coppersmiths, motor-cyclists, electricians, fitters, and instrument repairers may be accepted even though fit for general service.

Clerks, draughtsmen, shoemakers, and telephonists must be in Category B 3. Cooks must be in Category B 2, and, as a rule, so must coppersmiths, motor-cyclists, men for the labour section, painters, and technical storemen.

Men who will be accepted from either B 1 or B 2 are:—Motor transport drivers, electricians, engine-fitters, instrument repairers, photographers, cabinet-makers (as riggers), sailmakers, vulcanisers, men for the balloon party and Silcol plant, and balloon riggers.

The Recruiting Officer is Major Mitchell, the Polytechnic, Regent Street, W.

[When one considers the already enormous size of the R.F.C., one is led to believe that this further enlargement indicates a very real intention to build up an overwhelmingly great Flying Corps, and one wishes those in control every success in their efforts to win complete command in the air.—Ed.]

The Nottingham Corporation at a special meeting on Nov. 24th decided to confer the honorary freedom of the City upon Capt. Albert Ball, M.C., D.S.O., R.F.C., recently decorated at Buckingham Palace by the King. He is the son of a former Mayor of the City, who is also a director of the Austin Motor Co.

The Rev. W. A. Haslam, who for the past four years has been curate at Long Ditton, appears to have been ostracised from all ecclesiastical matters in the parish because he has obtained a commission in the Royal Flying Corps! Mr. Haslam tells his

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parishioners in a letter in the "Surrey Comet" that he committed this "heinous crime, according to a particular ecclesiastical opinion," with the full sanction of the Bishop of the diocese. He adds: "I have no desire to be officially associated with an English institution which has shown in no undecided manner such an intensely unpatriotic tone in a time such as this."

THE CASUALTY LIST.

Reported Nov. 22nd.

CORRECTION.—OFFICER KILLED.—Bidmead, Sec. Lt. C. H., Shropshire L.I. and R.F.C. (reported killed), should read:—Bidmead, Sec. Lt. C. H., General List and R.F.C.

Reported Nov. 23rd.

KILLED.—Martin, Sec. Lt. H. E., R.F.C.
WOUNDED.—Barry, Lt. J. V., A.S.C., attd. R.F.C.
Brewis, Lt. J. A. G., Durham L.I., attd. R.F.C.

Reported Nov. 24th.

WOUNDED.—Fitzgerald, Sec. Lt. W. W., R.F.C.
Rickards, Capt. H. G., R.F.A. and R.F.C.
MISSING.—Bacon, Lt. D. H., R.F.C.

Macneill, Sec. Lt. D. A., R.F.C.
Struben, Sec. Lt. L. F., Dragoon Guards, attd. R.F.C.

PRISONERS IN TURKISH HANDS.—PREVIOUSLY REPORTED BELIEVED TAKEN PRISONERS AT KUT, NOW REPORTED PRISONERS.—R.F.C.—Read, 4475 Sgt. F.; Welch, 4136 1st Cl. Air Mech. S. B.

Reported Nov. 25th.

WOUNDED.—Goudie, Lt. R., Highland L.I., attd. R.F.C.
Helliwell, Sec. Lt. M. R., R.F.C.
Shewell, Sec. Lt. A. V., Gloucester Regt., attd. R.F.C.
MISSING.—Allen, Sec. Lt. R. G. R., W. Yorks Regt., attd. R.F.C.

Cowan, Capt. S. E., M.C., R.F.C.
Crawford, Sec. Lt. W. C., R.F.C.
Saundby, Sec. Lt. W. S. FitzR., Yorks Regt., attd. R.F.C.
KILLED.—R.F.C.—Heatley, 8824 2nd Cl. Air Mech. C. F.
WOUNDED.—R.F.C.—Brindle, 15355 2nd Cl. Air Mech. P.
DIED.—R.F.C.—Taylor, 4602 1st Cl. Air Mech. W. E.
WOUNDED—SHOCK (SHELL).—R.F.C.—Alexander, 7912 2nd Cl. Air Mech. J.; Foreman, 12591 2nd Cl. Air Mech. W. G.

Reported Nov. 27th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Mathewson, Lt. K., R.F.C.

Rees, Lt. T., R. Welsh Fusiliers, attd. R.F.C.
WOUNDED.—Henderson, Sec. Lt. K. S., R.F.C.
Tivy, Sec. Lt. R. V., London Regt. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS, AS A PRISONER OF WAR IN GERMAN HANDS.—Morriss, Sec. Lt. L. B. F., Queen's (R.W. Surrey R.), attd. R.F.C.

KILLED.—R.F.C.—Barton, 2587 Sgt. F.; Bromley, 1312 Sgt. G.
DIED OF WOUNDS.—R.F.C., attd. R.G.A.—Foot, 4396 1st Cl. Air Mech. E.H.C.

PREVIOUSLY MISSING, NOW REPORTED DIED AS PRISONER IN TURKISH HANDS.—R.F.C.—Palmer, 4473 Sgt. T. N.

Reported Nov. 28th.

MISSING.—Clarke, Lt. T. H., A.O.D., attd. R.F.C.
Doughty, Sec. Lt. G., R. Scots, attd. R.F.C.
Hall, Sec. Lt. G. S., R.F.C.

PERSONAL NOTICES.

DEATHS.

BASSETT-SMITH.—Sec. Lieut. Thurstan Francis Bassett-Smith, R.F.C., eldest son of Mary and Walter Bassett-Smith, aged 19 years, died of wounds, on Nov. 23rd, in hospital.

* * *

BOWEN.—Lt. Eynon George Arthur Bowen, R.G.A. and R.F.C., reported missing on Sept. 8th, since reported died the same day, was the son of the late Eynon George Rice Bowen, of Troedyranr, Newcastle-Emlyn, and Mrs. Bowen, of Hambrook, Bristol.

Born in 1893, he was educated at Braidlea, Stoke Bishop, and was a scholar of Sherborne. He entered Woolwich in January, 1912, and was gazetted to the R.G.A. in December, 1913. He went to the front with a heavy battery in June, 1915, and in August became an observer, R.F.C. He passed as a pilot in May, 1916, and returned to the front.

His commanding officer wrote:—"He was a very valuable officer, both on account of his extensive knowledge of flying and also the manner in which he always performed his duties. He was an officer in whom I had complete confidence, and I feel his going very much."

* * *

DOBBYN.—A Hounslow Coroner's jury on Nov. 25th returned a verdict of accidental death in connection with the death of Lieut. Robert Newport Dobbyn, R.F.C., who was killed on a single-seater scout biplane. While flying at a low altitude the machine piloted by Mr. Dobbyn made a nose-dive and struck some uneven ground. The petrol tank then suddenly burst into flames, and the officer received injuries from which he died later. He was the son of a well-known Waterford solicitor. Death was stated to be due to concussion of the brain and burns.

HAARER.—Sec. Lt. Phillip McLellan Haarer, R.F.C., aged 20 years, was killed in action on Nov. 22nd. He was the son of Mr. and Mrs. E. C. Haarer, of 40, Earlsfield Road, Wandsworth Common, S.W.

* * *

MILLER.—Lt. W. Douglas Miller, R.G.A. and R.F.C., was killed on Oct. 2nd while flying over the German lines. He was the elder and only surviving son of the Rev. H. and Mrs. Miller, Shandon. His age was 24.

* * *

OLIVER-JONES.—Lt. Alfred Vernon Oliver-Jones, R.F.A., attd. R.F.C., who was reported missing and now officially reported killed on July 21st, was the elder son of the late William Oliver-Jones, nephew and adopted son of Mr. Alfred Taylor-Jones, of Wybourne Grange, Tunbridge Wells.

He was given a commission in the R.F.A. in Oct., 1914, and went to the front on Feb. 4, 1915. He was seriously wounded at the battle of Neuve Chapelle on July 9th, 1915. He subsequently joined the R.F.C., and became a qualified observer on March 11th last.

His colonel writes: "I shall feel his loss very much; it seems such very hard luck that this should have happened after his coming out so gallantly a second time. We shall all miss him very much. A very gallant officer has been lost to the British Army in your nephew."

* * *

SAINT.—Sec. Lt. William Bell Saint, Royal Scots, attached R.F.C., killed on Sept. 15th, aged 23, was the younger son of Mr. and Mrs. H. B. Saint, of Selborne, Monkseaton. Mr. Saint was educated at private schools, then at Stramongate School, Kendal, and Mill Hill. On leaving school at the age of 19 he went into the business of Angus Watson and Company, of which his father was a partner, and remained there for about two years until the month of Sept., 1914, when he joined the U.P.S. Brigade. He received a commission in the Royal Scots early in June last year. In January he became an observer R.F.C. He went to the front on May 21st and saw a considerable amount of active service. His commanding officer writes:—"I am very sorry indeed to lose your son." He was one of the veteran observers of the squadron and had done extremely good work all the time. He is a great loss to the squadron."

* * *

SKINNER.—Capt. Alfred Skinner, South Lancashire Regt. and R.F.C., eldest son of Mr. and Mrs. William Skinner, Hill Top, Latchford, Warrington, was killed over the German lines on Aug. 31st. His age was 25.

* * *

MARRIAGES.

CARTER—LENTON.—On Nov. 21st Lt. Frank Leslie Carter, E. Surrey Regt., attached R.F.C., was married to Freda N. Lenton, eldest daughter of the late Joseph Lenton, Esq., of Biggleswade, at St. George's, Hanover Square, by the Rev. Canon Edgar Sheppard, K.C.V.O., D.D., Sub-Dean of the Chapels Royal.

* * *

WALTERS—EVERETT.—The marriage took place on Wednesday between Lt. A. M. Walters, R.F.C., eldest son of Arthur M. Walters, Holmwood, Surrey, and Sybil, younger daughter of the late Mr. H. S. Everett and Mrs. Everett, Boston, Mass., U.S.A.

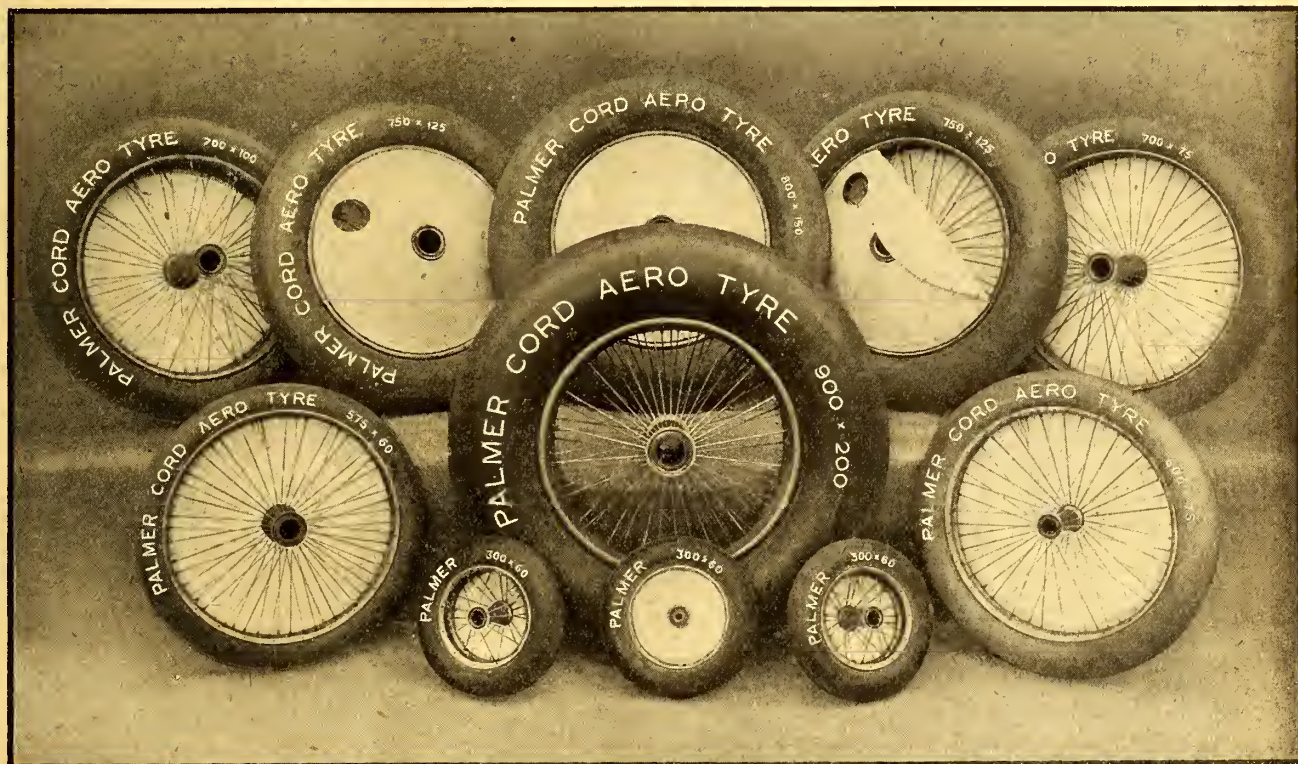


Second Lieutenant (temporary Captain) Albert Ball, D.S.O. and M.C., Nottingham and Derby Regiment, and Royal Flying Corps, who has been awarded a second bar to his Distinguished Service Order. The first case on record of such an award. The D.S.O. and the first bar were awarded in the "Gazette" dated September 16th, 1916. He is credited with having shot down at least forty German aeroplanes. He is the son of Alderman Ball of Nottingham, who is also a director of the Austin Motor Co.

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		m/m	m/m	m/m			m/m	m/m	m/m			m/m	m/m	m/m
300 x 60	16	111.12	25.4	Central	700 x 75	9	178.	44.45	132/46	750 x 125	2	185.	55.	135/50
"	17	72.39	12.7	Central	"	20	178.	38.09	132/46	"	4	185.	55.	Central
					"	75	178.	31.75	132/46	"	18	178.	44.45	132/46
450 x 60	30	89.	31.75	Central	"	80	178.	31.75	132/46	"	26	150.	40.	Central
					"					"	33	150.	38.09	Central
575 x 60	14	150.	38.09	104/46	700 x 100	2	185.	55.	135/50	"	38	178.	38.09	132/46
"	21	160.	28.	Central	"	4	185.	55.	Central	"	66	178.	38.89	132/46
"	34	150.	31.75	104/46	"	18	178.	44.45	132/46	800 x 150	8	185.	55.	135/50
					"	26	150.	40.	Central	"	10	185.	55.	Central
600 x 75	14	150.	38.09	104/46	"	33	150.	38.09	Central	"				
"	21	160.	28.	Central	"	38	178.	38.09	132/46	900 x 200	42	185.	60.32	125/60
"	34	150.	31.75	104/46	"	66	178.	38.89	132/46	"	47	185.	55.	125/60
										1100 x 200	52	185.	55.	116/69
										"	57	185.	55.	Central

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

VERNHAM—JARY.—On Nov. 17th Sec. Lt. N. M. H. Vernham, R.F.C., youngest son of Mr. and Mrs. J. E. Vernham, of 5, Warrington Crescent, London, was married to Violet Kathleen, daughter of the late William Jary, of Yarmouth, at St. Saviour's, Paddington.

* * *

ENGAGEMENT.

KEBLE-WHITE—PRETTY.—The marriage arranged between Capt. Alister F. Keble-White, Suffolk Regt. and R.F.C., eldest son of the Rev. A. and Mrs. Keble-White, of Chevington, Suffolk, and Doris Freda, only daughter of Lt.-Col. W. T. Pretty, T.D., D.L., Suffolk Regt., and Mrs. Pretty, of Goldrood, Ipswich, will take place quietly at St. Mary Stoke, Ipswich, on Dec. 20th, at 2.15 p.m. There will be no invitations, but all friends will be welcome at the church and afterwards at The Goldrood.

* * *

BIRTH.

SIMPSON—JONES.—On the 22nd Nov., at 23, Bracknell Gardens, Hampstead, N.W., to the wife of F. H. Simpson-Jones, R.F.C., a daughter. Australian papers, please copy.

AIR BOARD REPORTS.

The following report was issued for publication on Nov. 24th:—

In almost all cases the fights in which our airmen engage are against odds. In some of these combats, as, for instance, the one in which Capt. "M" and Capt. "S" (observer) destroyed a German machine, the odds are as great as five to one. Almost without exception they are two to one.

On Oct. 20th, which is described as a day of great aerial activity, six of our machines, while taking photographs, were heavily attacked by anti-aircraft guns, and, soon after, by twelve hostile fighting machines. One of our machines was brought down by the enemy to his lines, and another brought to land behind our lines, with the pilot severely wounded. The enemy machines having withdrawn, Capt. "D," the leader of our formation, tried to complete his reconnaissance, accompanied by only two escorting machines. He was again attacked, and another of our machines retired with engine and propeller damaged. Capt. "D" then fought his way homeward, surrounded by hostile machines, and landed safely.

The number of combats in the air on Oct. 20th exceeded 80. Seven enemy machines were seen to crash or to fall out of control, and there can be no doubt that others of those which were driven down by our airmen were wrecked in landing. The fact that these combats took place over the enemy's lines prevents absolute verification.

It is not to be expected that operations on this scale can be carried out without losses of valuable lives or without wastage in matériel. Three of our aviators were killed, three reported missing, and five wounded.

The communiqués record at least two instances of conspicuous pluck and endurance. Sec. Lieut. "S," though mortally wounded by gun fire, brought his machine and observer safely back to his own aerodrome. He died of his wounds next day. Lieut. "S," though wounded in the head at the beginning of a combat in which he and Sec. Lieut. "G" were opposed to six German machines, continued to fight for a considerable time and drove down one of the enemy machines out of control.

Much of the success obtained by our artillery is due to the effective co-operation of the aviators, and a captured letter, written by a man of a German artillery regiment, affords a good clue to the damage caused by our artillery. It states that during eight weeks his battery fired 34,000 rounds and used up 28 guns, of which 17 were knocked out by British artillery fire.

The entry on Oct. 20th, "more than 700 photographs were taken," illustrates another, and not the least important, of the activities of the Royal Flying Corps.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Nov. 21st.—Last night our bombarding aeroplanes dropped a hundred bombs on the enemy bivouacs behind the Somme front.

Nov. 23rd.—Sous Lt. Guynemer brought down during the day his 22nd German machine. The enemy aeroplane fell near St. Christ (south of Péronne).

Our bombarding aeroplanes yesterday dropped many bombs on the railway stations and bivouacs of the enemy on the Somme front.

ARMY OF THE ORIENT.—Our aeroplanes bombarded enemy encampments in the Topolani and Prilep regions. In the course of an aerial fight one of our aeroplanes brought down two enemy machines in the Drama district.

Nov. 24th.—Yesterday, in Lorraine, three British aeroplanes fought an engagement with several German machines. One enemy machine was brought down in the forest of Gremecey.

On the same day, on the Somme front, our aviators fought about 40 engagements, in the course of which five machines were brought down. Maréchal de Logis Flachaire brought down his

sixth machine near Manancourt (east of Saillisel), and Lt. Doullin his 10th south of Vaux Wood.

It is confirmed that on Nov. 22nd Sous Lt. Guynemer brought down a second enemy machine in the region of Falvy (east of Chaules). This brings the number of aeroplanes brought down by this pilot to 23.

Six of our machines dropped 15 bombs of 120 mm. on Bruyères. Another of our air squadrons carried out a bombardment of the aerodrome of Griselles (north of Château-Thierry). Between 3.45 p.m. and 7 p.m. 171 bombs of 120 mm. were dropped.

Last night, between 9.30 p.m. and 1.10 a.m., four of our machines bombarded the blast furnaces and factories of Völklingen (north-west of Saarbrücken). During this expedition 12 bombs of 120 mm. and 12 of 155 mm. were dropped and appear to have been well placed. Our machines returned unharmed.

Yesterday afternoon a German aeroplane was brought down by the fire of our anti-aircraft guns. The machine fell to the north of Berry-au-Bac.

The same day Maréchal de Logis Vialat brought down his sixth German machine near Moislains (east of Bouchavesnes).

Nov. 25th.—Yesterday, between 11 a.m. and 1 p.m., a group of aeroplanes of the British Naval Air Service bombarded the blast furnaces of Dillingen (north by west of Saarbrücken).

During this expedition 1,000 kilograms (one ton) of explosives were dropped. Most of the projectiles struck their mark.

An enemy aeroplane was brought down during the return journey.

Nov. 26th.—**ARMY OF THE ORIENT.**—British aeroplanes bombarded the enemy's camps in the region of Neghori, at the mouth of the Struma.

Nov. 27th.—A group of our aeroplanes last night bombarded the aerodromes of Guizancourt and Matigny. The projectiles successfully struck their objectives.

* * *

It is reported that Capt. Beauchamp, the hero of the recent raid on Munich, reached Paris on Nov. 26th from Rome. He was very warmly congratulated on the success of his raid. He would, he explained to those who met him, have preferred to return by way of the air, but, unfortunately, his machine was slightly damaged on landing.

He refused to be interviewed, but certain further details of his flight have become known through one of his friends. At the outset of his flight mist made it difficult for him to verify his position. At Friedrichshafen he was furiously bombarded, but continued flying at a low altitude until he reached Munich. He then rose and dropped seven bombs on the station, all of which reached their objective and exploded. He rose to a height of 1,200 ft., and, turning southwards, made a good passage across the Alps. At last he recognised Venice and the Adriatic, and landed.

He was enthusiastically received at Venice by Admiral Derevel. Gabriel D'Annunzio offered him a gold medal, and at the Italian Headquarters he was received by General Cadorna and General Porro. The King of Italy personally decorated him with the Order for Valour, and at Rome he was feted. He intends to carry out a fresh raid at the earliest possible moment.

GERMANY.

OFFICIAL COMMUNIQUÉ.

Nov. 21st.—Our air squadrons dropped bombs on communication establishments near Bukarest.

* * *

According to a report from Amsterdam, Nov. 25th, travellers from Munich report that a super-Zeppelin was wrecked in the storm which raged last Tuesday.

The airship, which was on its way from Friedrichshafen to Wilhelmshaven, was on its first voyage. It was blown out of its course by the gale, and fell into a wood near Mainz (on the left bank of the Rhine opposite the mouth of the Main).

There was one survivor of a crew of 28.

The Zeppelin was wrecked beyond repair.

Such reports should be received with considerable mental reservation.

* * *

The following letter written by a German officer of the 170th Regiment is an indication of the respect in which the R.F.C. are held by the unfortunates in the German front line trenches:—

"You in Champagne are no longer in the witches' cauldron on the brim of which we are sitting—always awaiting the moment to fall in from one side or the other. It is turmoil here again. The air has been alive with aviators in the past few days, and still more so with the heavy shells that have been flying over us and onto our poor comrades on our flank and onto our batteries.

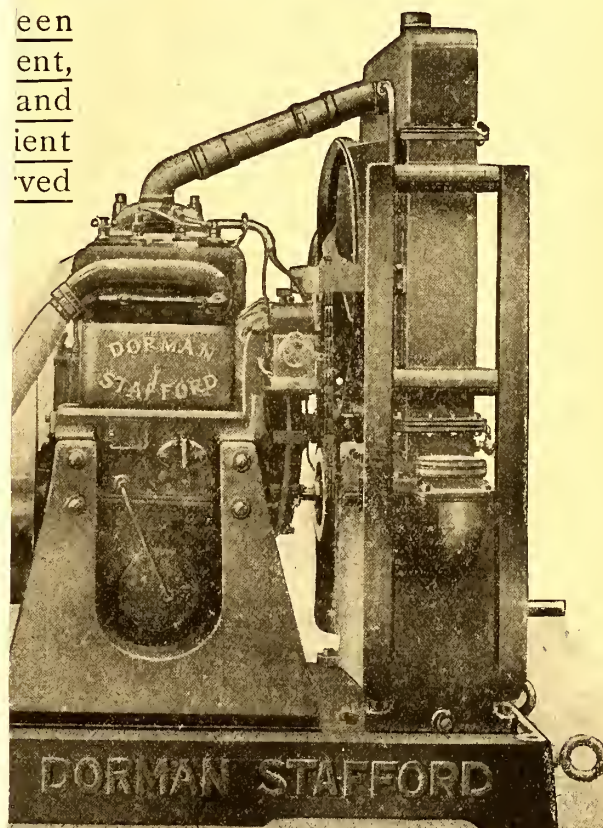
"The number of guns—and of the heaviest calibre—which the English now possess is uncanny, and the amount of ammunition they fire off is fabulous. In addition—what makes it so bad—their aviators are constantly over our lines. They point out our batteries so that they may be peppered, and are always attacking our captive balloons, which is the same as putting our eyes out. Meanwhile, the air is black with their aircraft, whereas our

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aviators—but of that why speak? It would be merely pouring water into the Rhine. We could save many thousands of lives if we had the English aviators and gunners. It makes me despair when I think of it all."

RUSSIA.

OFFICIAL COMMUNIQUÉS.

Nov. 24th.—In the region of the little hamlet of Verba (on the Brody-Dubno railway), north of Kremenetz (north of the Galician border), an Austrian aeroplane was co-descend, and the aviators were taken prisoners.

On the river Bystrzyca our aviators successfully took on the enemy's artillery depot in the village of Pavel railway north-west of Stanislaw.

Our scouts made a series of successful reconnaissances in the region of Kosmatch and Poroge, north-west of Zolot.

Nov. 26th.—NORTHERN FRONT.—Near Prudy railway north-west of Molodetchno (which is south-east of) shot down a German aeroplane by machine-gun fire a aviators, an officer and a private, prisoners.

VOLHYNIA.—On the Stokhod an enemy aeroplane was down from near the village of Pojarki, north of Rozl near the village of Vulká Porska. The wings of it were burnt. We took the aviators prisoners.

West of Novo Alexinetz (which is on the Galician enemy violently bombarded our positions. Enemy a over our positions. One of them, attacked by our av Vaftalovsky, was brought down after a fight lasting hour, and fell to the earth near Rudnia Potchaieff railway. The machine is intact. We captured two machine-guns in it and took the pilot and observer prisoners.

* * *

At Minsk recently the funeral took place of the French Lt. Meritel, and his mechanic Bubier, who had arrived from the Russian front from France. They were victims of an accident while testing a machine that had never been flown in the presence of Russian military aviators.

The entire staff, headed by General Evert, the Chief of the Russian military aviators, comrades of the deceased, and a general public assembled to pay a last tribute of respect to the French aviators. A Russian aeroplane flew above the cortege en route and during the actual interment. The interment at Minsk is only temporary, as the bodies are being conveyed to Petrograd and thence to France for final interment. Lt. Meritel was 27 years old.

AUSTRIA.

OFFICIAL COMMUNIQUÉS.

Nov. 24th.—FRONT OF PRINCE LEOPOLD OF BAVARIA.—Our aviators, Lt. Popelak, while on a reconnoitring flight near Brody, was attacked by three Russian battle-aeroplanes, forced them to take to flight, and drove them to the rear behind their own lines.

ITALY.

OFFICIAL COMMUNIQUÉS.

Nov. 25th.—Hostile aircraft dropped bombs on Agnes and Primolano, in the Sugana Valley, wounding two persons. They were driven off by our aeroplanes, which rose in pursuit.

Nov. 26th.—Hostile aircraft attempted to make raids on localities in the theatre of operations, but were driven off by our anti-aircraft guns and by our aviators.

An enemy air squadron which had succeeded in dropping bombs on Tolmezzo without doing any damage was dispersed by aircraft, and an enemy aeroplane was shot down, one of the aviators being killed and the other taken prisoner.

As the result of an air fight near Biglia, south-east of Milan, another enemy aeroplane was shot down.

ROUMANIA.

OFFICIAL COMMUNIQUÉS.

Nov. 21st.—Yesterday the enemy again displayed activity by bombarding the capital five times, killing a number of persons, especially women and children.

Nov. 24th.—Between Calafat and the Jiu we captured an enemy aeroplane.

* * *

The following was reported by the "Times" correspondent at Bukarest on Nov. 26th:—

The capital has again been the scene of an air raid by the enemy. From ten o'clock in the morning until three in the afternoon squadrons of aeroplanes flew over Bucharest, dropping bombs and killing several people. Several of our aeroplanes gave chase to the enemy machines and engaged them in combat.

Further British aeroplanes and pilots have reached the capital after very long flights, to join the British aircraft already in Roumania, and to reinforce the British and French aeroplanes now operating with the Roumanian Army.

BULGARIA.

OFFICIAL COMMUNIQUÉS.

Nov. 22nd.—MACEDONIAN FRONT.—South of Monastir

an aeroplane was brought down by our artillery fire and fell in flames behind the enemy's lines.

Nov. 23rd.—Enemy aeroplanes dropped bombs on our positions near Orfano and the bridge near Buk, but obtained no result.

BELGIUM.

OFFICIAL COMMUNIQUÉ.

Nov. 21st.—"Our aviators have been very active during the week. The enemy aviation camp at Ghislenghien and hostile centres

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IN THE HANDS OF THE ENEMY.

The following information is to hand from THE AEROPLANE'S Danish Correspondent. The list, taken from German official publications, of machines which fell into German hands, will be of sad, but useful, interest to the Services. The names of engines may seem peculiar in some instances, but it must be remembered that these have doubtless been transmitted by non-technical units to the German Aviation Service, and consequently makers' names instead of designers' names have been given. Many of the names of pilots also have doubtless been altered in the course of various transcriptions. The correspondent writes:—

The German list of aeroplanes captured from the Allies during the month of August, 1916, reads to the effect:—

FRENCH AEROPLANES.

1. Caudron biplane No. 2059. Motor, two le Rhône No. 6766 and 6763. Crew: Sub. Lt. Marcel Bronssart, Cpl. Charles Fouchée.
2. Nieuport Biplane, No. ? Motor, Renault No. ? Pilot: Lt. Baudry.
3. Nieuport biplane, No. 833. Pilot: Serg. Maffert.
4. Morane, No. 143. Motor, le Rhône No. ? who could not be recognised.
5. Nieuport biplane, No. ? Motor No. ? which could no more be ascertained, as the biplane was burnt complete, shot down on August 4th, 1916, at 9.8 o'clock in the morning, by Miséry to south-west of Péronne.
6. Caudron biplane, No. 1467, Motor two le Rhône Nos. ? Crew: Lt. Excole, Sub-Lt. Verdier.
7. Nieuport biplane, No. ? Motor No. ? Crew to be ascertained no more, as biplane completely burnt down; shot down in an aerial engagement on August 9th, 12 o'clock noon, by Gueudecourt to south-west of Bapaume.
8. Nieuport biplane, No. 1520, Motor Clergèt No. 830. Crew: Lt. de Rolland, Cpl. Raymond Boudand.
9. Nieuport biplane, No. 1179, Motor le Rhône No. 3523. Crew: Sergt. Hermann Hentsch, Sergt. Felix Verët.
10. Caudron biplane, No. 306, Motor Clergèt No. 479. Pilot: Quartermaster de Teterline.
11. Caudron biplane, No. 1309, Motor two le Rhône No. 332 and No. ? Crew: Cpl. Andrée Jouanny, Probationer Marc Florentin.
12. Nieuport biplane, No. 1472, Motor le Rhône No. 4574. Pilot: Gras, Escadrille de Chasse 48.
13. Caudron biplane, No. ? Motor No. ? Pilot Officer Taubert, Escadrille F.203.
14. Nieuport biplane, No. 1552. Motor le Rhône No. 4416. Pilot: Sergt. Danguenger, Escadrille 37.
15. Nieuport biplane, No. 1573. Motor No. ? Pilot: Charles Dumas, Escadrille 57.

16. Caudron biplane, No. ? Motor, two le Rhône Nos. ? Crew: Lt. Hembert, Sergt. Armand Mars.
17. Caudron biplane, No. 1325. Motor, two le Rhône Nos. 3281 and 121. Crew: Cpl. Louis M. G. Schutze, Quillard.
18. French flying-boat (F.B.A.?), No. 316. Motor, Hispano-Suiza, without number. Crew: Sub-Lt. Charles Tesa, Sub-Lt. Gaston Guesne.

BRITISH AEROPLANES.

1. Vickers biplane, No. ? Motor ? Shot down on August 1st, 1916, at 3.14 o'clock afternoon to the south-west of Bapaume. Aircraft and crew burnt completely.
2. B.E. biplane, No. 546. Motor, Renault No. ? Pilot: Capt. C. W. Snook, Squadron 6.
3. English biplane, No. 5177. Motor No. ? Crew: Lt. F. G. Newton, Sergt. G. A. Ormsby.
4. Sopwith biplane, No. 5681. Motor No. ? Crew: Lt. L. Clark, Sergt. A. Walker.
5. Vickers biplane, No. 384. Motor No. ? Crew: Lt. Machenson, Pte. Eric Mercill.
6. Martinsyde biplane, No. 7307. Motor, Beardmore No. 547. Pilot: Lt. Turner.
7. B.E. biplane, No. 7. Motor, Renault No. ? Crew not to be ascertained as aeroplane completely burnt. Shot down on August 5th, 1916, 7.15 in the evening, to the north-west of Bapaume.
8. Sopwith biplane, No. ? Motor, Gnome No. ? Crew: Lt. Blain and C. D. E. Griffith.
9. B.E. biplane, No. ? Motor ? Pilot: Leggat.
10. Vickers biplane, No. ? Motor ? Crew: Lt. G. A. Mann, the second passenger could be ascertained no more as he was burnt completely.
11. Avro biplane, No. ? Motor ? Crew could not be ascertained. Shot on August 9th, at 12.25 noon, south of Bapaume.
12. Vickers biplane, No. ? Motor ? Crew not to be ascertained as aeroplane completely burnt. Shot down in aerial engagement on August 12th, 1916, 5 p.m., by Courcellette.
13. B.E. biplane, No. 6549. Motor No. ? Pilot: Sub-Lt. G. L. Clifford Geen, 19th Squadron.
14. English seaplane, No. ? Motor ? Crew: Lt. P. C. Tocke, Lt. C. R. Nival.
15. B.E. biplane, No. 2613. Motor, English Daimler No. ? [Probably intended for English-built Austro-Daimler, otherwise an early type Beardmore.—Ed.] Crew: Lt. R. T. Griffin, Lt. Whitehead, 2nd Squadron.
16. Sopwith biplane, No. ? Motor ? Crew: Capt. R. D. Hopwood, Gunner G. L. Pearce.
17. Vickers biplane, No. 4285. Motor, English Daimler No. 475. Crew: Lt. R. T. Walker, Lt. Smith.



IN THE HANDS OF THE ENEMY.—An Italian Nieuport, shot down by the Austrians. It is interesting to note the dent in the leading edge of the wing, indicating how the machine tried to stand on its nose, and was thrown back by hitting the wall.

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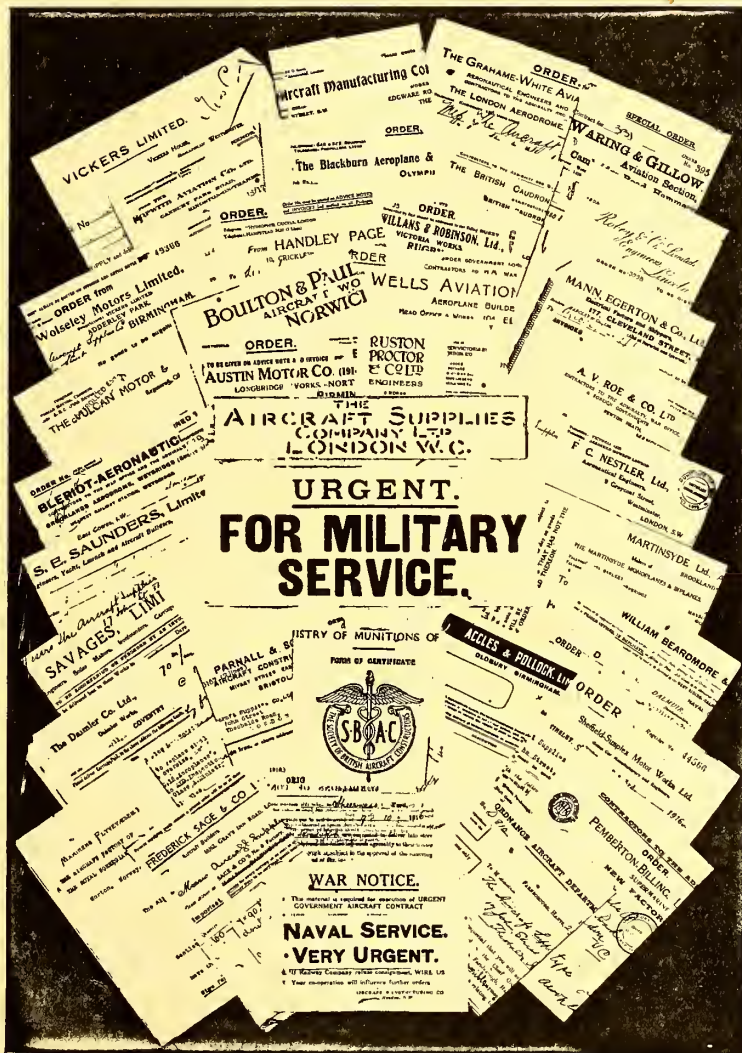
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18. Vickers biplane, No. 5994. Motor, Gnome No. 30393. Pilot: Lt. Turner.
19. B.E. biplane, No. 5445. Motor, Renault No. ? Pilot: Sub-Lt. Corbold.
20. B.E. biplane, No. 6532. Motor, Daimler No. 25139. Pilot: Lt. A. W. Reynell.
21. Avro biplane, No. ? Motor, le Rhône No. ? Crew: Lt. Obling, Lt. Maze, 70th Squadron.
22. Morane monoplane, No. 173. Motor, le Rhône No. 576. Pilot: Lt. Beauchamp Mervyn Wainwright, 60th Squadron.
23. B.E. biplane, No. ? Motor ? Crew not to be ascertained as aircraft was completely burnt. Shot down on August 26th, 8.6 in the evening, west of Athries.
24. Bristol biplane, No. 6562. Motor, Daimler No. 25159. Pilot: Lt. Briggs.
25. Bristol biplane, No. 5836. Motor, Ansting [Anzani, or Austin?] No. 642. Crew: Lt. Cairnes, Lt. Tulloch.
26. B.E. biplane, No. ? Motor ? Crew not to be ascertained any more. Shot down on August 26th, 1916, at 8.15 in the evening, north-west of Nèfle.
27. Martinsyde biplane, No. ? Motor ? Pilot: Lt. Strange.
28. Martinsyde biplane, No. 7482. Motor, Beardmore No. 449. Pilot: Capt. Skinner.
29. Martinsyde biplane, No. 7479. Motor, English Daimler No. 2435. Pilot: Lt. Byrne, 27th Squadron.
30. Martinsyde biplane, No. 7299. Motor No. 498. Crew not recognisable.
31. B.E. biplane, No. 5235. Motor, English Daimler No. 6903. Crew: Lt. MacIntosh, Lt. MacFee.

The corresponding list of captured Allied aircraft during September, 1916, is as follows:—

FRENCH AEROPLANES:—

1. Nieuport biplane, No. 1276, type 12. Motor, Clergêt No. 797. Pilot: George Duc, Maréchal-de-Logis.
2. Nieuport biplane No. 1640, type 21. Motor ? Pilot dead, name could not be ascertained.
3. Caudron biplane, No. 1574, type G 1. Motor, two le Rhône, Nos. 421 and 664. Crew: Capt. Bertin, machine gunner; name of other passenger could not be ascertained. Escadrille 64.
4. Nieuport biplane, No. 146. Motor, Gnome No. 930. Crew: Lt. Richard and Sergt. Rousseau.
5. Caudron biplane, type XVII, No. 1457. Motor ? Crew: Sub Lt. Antoine Durand, Sergt. Frencha.
6. Caudron biplane, No. 1475. Motor ? Crew: Cpl. Berthes, Sub. Lt. Claudel.
7. Nieuport biplane, No. ? Motor, two le Rhône No. ? Pilot: Sub. Lt. Charles Bordes.
8. Caudron biplane, No. ? Motor No. ? Crew could not be ascertained as aeroplane completely burnt. Shot down on the 8th Sept., 1916, at 6.25 in the evening by Gueudecourt.
9. Nieuport biplane, No. ? Motor, Grone No. 850. Pilot could not be recognised. Propeller No. 3595, marked on the left connecting surface, type 21.
10. Caudron biplane, No. ? Motor, two le Rhône Nos. 5470 and 5010. Crew's names could not be ascertained.
11. Caudron biplane, type G IV, No. 2614. Motor, type ? No. 44/42 and 46/32. Crew: Maréchal-de-Logis Auguste Tronde, Caporal Marcel Flaumann.
12. Nieuport biplane No. 990. Motor type could not be ascertained, completely smashed. Pilot: Gst. Spencer.
13. Nieuport biplane, type 17, No. 1581. Motor, le Rhône No. 3899. Pilot, Sub-Lt. de Roquetort.
14. Morane monoplane, No. ? Motor, le Rhône No. ? Pilot, Capt. ? Name could not be ascertained as body completely burnt. Shot down on the 19th Sept., 1916, above the Grevillers Wood.
15. Nieuport biplane, type 17, No. 3315. Motor, le Rhône, No. 821. Pilot: Cpl. Victor Boundet. Escadrille No. 112.
16. Nieuport biplane, type 21, No. 1712. Motor, le Rhône No. 5046. Pilot, Sub-Lt. Guy de Baumville.
17. Nieuport biplane, No. 3315. Motor ? Type could not be ascertained. Pilot, Lt. Masquellier.
18. Nieuport biplane, type 21, No. 1706. Motor, le Rhône No. 7456, type C 5067. Pilot, Maréchal-de-Logis Edolf Marie Jean Baptiste le Comte Grandmaison.
19. Caudron biplane type IV, No. ? Motors, two le Rhône Nos. 3173 and 4148, Crew: Sous-Lt. Georg Vonause, Sous-Lt. José Roydellet. Escadrille, C.E.P. (R.E.P. ?) 115.
20. Caudron biplane, No. 2208, type G 4. Motors, two le Rhône Nos. and type unascertainable. Crew: Lt. Maurice Mumier, Lt. André Dellon. Escadrille C 6.
21. Caudron biplane, type 4, No. 2644. Motor, le Rhône, type C, No. 2576. Pilot, Chanoli. Escadrille 124.

BRITISH AEROPLANES:—

1. B.E. biplane, No. ? Motor, Gnome No. 30010. Pilot, Capt. Wilson.
2. F.E. biplane, No. 4290. Motor, Beardmore No. 26. Crew: Lt. Bardon, Lt. Griffith.
3. Sopwith biplane, No. ? Motor ? Names of crew could not be ascertained. The aeroplane was the leading one of a Squadron.

Shot down on the 2nd September, 1916, 8.20 in the evening by Boulton to west of Cambrai.

4. F.E. biplane, No. 6934. Motor, Marston No. 28425. Crew: Lt. Frank Douglas, Cpl. Junners, 23rd Squadron.
5. Vickers biplane, No. 2939. Motor ? Complete smashed. Pilot an officer whose name could not be ascertained. Main planes No. 12941, rudder marked A.M.C. 7887.
6. Bristol biplane, No. 7070. Motor ? Name of pilot could not be ascertained.
7. Sopwith biplane, No. ?. Motor type ? 9 cylinders, No. ? Crew: two officers whose names could not be ascertained. Shot down on the 6th September, 1916, at 4.30 in the evening by Dévise, north-west of Achies.
8. Vickers biplane, No. ? Motor, Daimler No. 255. The name of the crew could not be recognised.
9. Vickers biplane, No. ? Motor, Gnome type B 692, No. 6425. Pilot, a lieutenant, killed. Name could not be ascertained.
10. Type unknown. Crew: Lt. Vernon, Lt. Firebank.
11. Sopwith biplane, No. ? Motor, Clergêt, 110-h.p., No. ? Pilot, Sec. Lt. Organ.
12. Sopwith biplane, No. 897. Motor ? Crew: Lt. Ale; a corporal whose name could not be ascertained.
13. Vickers biplane, No. 7873. Motor, Gnome No. ? Pilot ? Name could not be ascertained.
14. Sopwith biplane, No. 895. Motor, Gnome No. 973. Pilot dead. name could not be ascertained.
15. Nieuport biplane, No. ? Motor ? Crew: Lt. Bowyer, Lt. Saint.
16. B.E. biplane, No. 6583. Motor, Renault No. 20738. Pilot: Lt. Elphinston.
17. B.E. biplane, No. 6164. Motor, Renault No. 8232. Pilot: Lt. Gilbert Klingenstein.
18. F.E. biplane, No. ? Motor ? Crew: Names could not be ascertained. Shot down on Sept. 15th, 1916, at 6.20 in the evening by Hoplincourt.
19. B.E. biplane, No. 4495. Motor, Renault No. 792. Pilot: Sergt. Cushing Dougall.
20. Martinsyde biplane, No. 7484. Motor, Daimler No. ? Pilot: Sub-Lt. Kennedy, 22nd Squadron.
21. F.E. -biplane, No. 6669. Motor, Daimler No. ? Pilot: Name could be ascertained no more. The planes were marked with the figure 15.
22. Vickers biplane, No. 7018. Motor, Daimler No. 701. Crew: Cpl. Rees, pilot, Observer unrecognisable.
23. F.E. biplane, No. 7063. Motor No. ? Pilot: Name could not be recognised.
24. Vickers biplane, No. 4852. Motor, Daimler 6-cylinder No. ? Crew: Lt. Frederic George Thierry, Buck.
25. F.E. biplane, No. 6994. Motor, Beardmore No. 662. Crew: Lt. Thomsen, Cpl. John Edward Gloyer.
26. B.E. biplane, No. 5873. Motor, type ? No. 1302, W.D. 1472. Pilot: Lt. Paterson.
27. Sopwith biplane, No. ? Motor ? Crew: Names could not be recognised. Shot down on Sept. 17th, 1916, 12 o'clock noon to south of Estrées.
28. F.E. biplane, No. ? Motor ? Crew: Names could not be recognised. Shot down on Sept. 17th, 1916, at 11.35, morning, south of Trescault.
29. Avro biplane, No. 2470. Motor, Beardmore No. 337. Crew: Names could not be ascertained.
30. B.E. biplane, No. 2471. Motor, type ? No. 3896. Pilot: Lt. Money.
31. Sopwith biplane, No. 1913. Motor, Rinston, No. ? Crew: Their names could not be recognised.
32. F.E. biplane, No. 4934. Motor Beardmore, No. 283. Crew: Sec. Lt. Canter, Sec. Lt. Gray.
33. F.E. biplane, No. 6927. Motor, Beardmore No. 556. Crew: Pilot Thomas Jones, Observer F. A. Hewson.
34. B.E. biplane, No. ? Motor ? Crew: Names could not be recognised as the biplane fell in the first-line trenches. Shot down on Sept. 21st, 1916, at 9.15 in the morning, by Mesnil.
35. B.E. biplane, No. 6574. Motor ? Pilot: Sec. Lt. Hedderwick.
36. Sopwith biplane, No. ? Motor, Rinston, No. ? Crew: The names could not be ascertained as the aeroplane was completely burnt. Shot down on Sept. 22nd, 1916, at 9.15 in the morning, by St. Pierre-Wald.
37. B.E. biplane, No. 6544. Motor, Daimler No. 35164. Pilot: Lt. Hedderwick. [Some evident mistake in transcription here.—Ed.]
38. F.E. biplane, No. 6993. Motor, Beardmore No. 681. Crew: Lt. Hunt, Cpl. Law.
39. Martinsyde biplane, No. 7475. Motor, Daimler, No. ? Crew: Their names could not be recognised.
40. Martinsyde biplane, No. 174. Motor Daimler No. 1420. Pilot: Bellerby.
41. Martinsyde biplane, No. 163. Motor ? Pilot: Roberts.
42. B.E. biplane, No. 7431. Motor ? No. 1420. Pilot, apparently a sub-officer, could not be recognised.
43. Martinsyde biplane, No. ? Motor Daimler ? Pilot: Lt. West.

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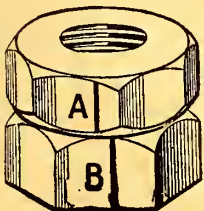
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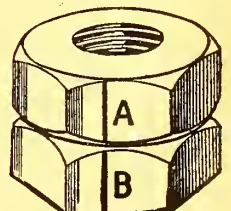


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44. Martinsyde biplane, No. ? Motor? Pilot: Edwards.
 45. Martinsyde biplane, No. 7498. Motor, type ? No. G 100/
 191. Pilot: Lt. Wingfield.
 46. F.E. biplane, No. ? Motor, Beardmore 168. Pilot: Sub-
 Lt. Dendrino.
 47. Sopwith biplane, No. 9705. Motor, Clergét No. ? Crew:
 Two officers whose names could not be recognised.
 48. Avro single-seater, No. 7495. Motor, type ? No. 168.
 Crew killed, and their names could not be recognised.
 49. Avro single-seater, No. A1568. Motor? Pilot's name
 could not be ascertained.
 50. B.E. biplane, No. 2742. Motor, Austin No. 679. Pilot:
 Lt. A. G. Casson.
 51. Vickers biplane, No. ? Motor, Daimler No. 8994. Crew:
 E. C. Landsdahl, the second passenger unrecognisable.
 52. Farman biplane, No. ? Motor No. ? Crew: Pilot Lutoni,
 Observer Tillich.

53. Farman biplane, No. ? Motor ? Crew killed, their names
 could not be ascertained. Shot down on Sept. 24th, 1916, at
 6.40 in the evening, by Nurle.

To this list "Flugsport" adds the following comment:—

An interesting fact about this list is that the British aero-
 planes dominate considerably; while their aviation before the war
 was far behind. They have now got lots of aeroplanes, vide this
 list in which 21 are of French origin, and 53 of English origin.

The air fights on the Western Front have during September
 attained a number surpassing any hitherto precedence, and being
 more violent than ever before. The French and British had
 acquired and mobilised aeroplanes in quantities and qualities on
 the Somme battlefield, against which the Germans on their side
 had to put in strong aerial forces. The German papers state
 that in spite of the considerable superiority in numbers of the
 enemy these air engagements, violent beyond precedence, which
 partly were fought over German lines and partly over the
 enemy's, have fallen out to the German advantage, as can be seen
 by the communiqué of Oct. 9th. One paper says:—"Special
 reference must be made to the fact that the enemy has lost no less
 than 47 aeroplanes over his own lines, which bloodily punishes
 ('strafes') the contention that German aeroplanes dare no more to
 cross the enemy lines."

The German communiqué of Oct. 9th read, re aircraft, to this
 effect:—

"We lost during September 20 aeroplanes in aerial engagements,
 and one aeroplane is missing. The French and English losses
 amount during the same time in aerial engagements to 97,
 through anti-aircraft guns 25, and through involuntary landings
 in our lines 7, totalling 129 aeroplanes."

[The above list should thus be incomplete, giving only 74 out of
 the 129 quoted.—Hr.]

* * *

"Flugsport" contains the official report of the Allied attacks on
 South German cities, from which we extract:—

"The attack on Oct. 12th was carried out between 3 and 5
 o'clock in the afternoon by hostile squadrons numbering 40 to 50
 aeroplanes. Of the attacking aeroplanes 9, including one British,
 were brought down by our aeroplanes and anti-aircraft guns. The
 inhabitants of Bremgarten witnessed for the third time the
 bringing down of a hostile aeroplane riddled with shots; the crew,
 who were slightly wounded, were taken prisoners by three alight-
 ing German aeroplanes. Numerous bombs stored in the burning
 machine exploded, and several had already been dropped over the
 village, having, however, not exploded in the soft ground. The
 French crew warned the peasants not to approach the aeroplane.
 During the air fight the population often did not know where to
 flee from the rising and plunging aeroplanes. Praise God, no
 losses of human beings is to be mourned.

"In Freiburg an English aeroplane was hit by anti-aircraft guns
 and forced to land. The pilot, an English Lieutenant, had, in
 spite of a severe wound in the head, had still the presence of mind
 to glide his aeroplane to a standstill on the Freiburg drill-ground.
 The officer was brought to the hospital. One aeroplane was
 brought down between Lehen and Hugstetten. A third was shot
 down in a fight near by Haslach, and fell burning on the City
 ground; the crew, two officers, were found dead. Further, an
 aeroplane was forced to land by Iringen by the Kaiserstuhl. Two
 came to grief over Breisach. Further, again, one aviator was
 forced to land by Krotzingen, and still another by Mülheim; the
 latter was an English Naval officer. The list of the 9 aeroplanes
 shot down is to the effect:—

1. Farman biplane, No. ? Motor, 130-h.p. Renault No. 54394.
 Crew: Adj. Baron, pilot; Sgt. André Guérineau, machine-
 gunner. Both killed—shot down in an air fight by Widensohlen,
 6 kilos, to north-west of Neubreisach.

2. Farman biplane, No. ? Motor, 130-h.p. Renault No. 55469.
 Crew: Armand George, pilot; Ernest Jouan, machine-gunner;
 both killed; shot down in the aerial fight by Iringen, 4 kilos.
 to the east of Neubreisach.

3. Bréguet biplane, type Bm., No. 534. Motor, 220-h.p.
 Renault, No. 5447, 12 cylinders. Crew: Lt. Rockey, pilot; Sgt.

Sterdee, bomb-dropper, taken prisoners. Shot down in aerial
 fight by Ouerenzen, 15 kilos, south of Colmar.

4. Bréguet biplane, type Bm. IV., No. 229. Motor, 220-h.p.
 Renault, No. 54561. Crew both killed, shot down in aerial fight
 by Rustenhardt, 10 kilos, south-west of Neubreisach.

5. Bréguet biplane, type Bm. IV., No. ? Motor, 220-h.p.
 Renault No. ? Crew: Sgt. Bouot, pilot; Pte. Delcroix, bomb-
 dropper, taken prisoner. Shot down in aerial engagement by
 Bremgarten, 12 kilos, north of Mülheim.

6. Sopwith biplane, type A1, No. 9660, captured intact.
 Motor, Clergét-Blin No. 260. Pilot, Naval Sub-Lt. Butterworth,
 wounded and taken prisoner. Shot down in aerial fight over the
 Freiburg aerodrome.

7. Bréguet biplane, type Bm. No. 538. Motor, Renault No.
 49501. Crew, both killed. Shot down in aerial fight by Unkirch,
 6 kilos, west of Freiburg.

8. Bréguet biplane, No. 436. Motor, Renault (12 cylinder)
 S. VI 358. Crew: Sgt. Mottay, pilot, wounded and taken
 prisoner; Cpl. Marchand, bomb-dropper, killed. Shot down in
 aerial fight by Steinbach (by the railway, Haslach—Offenburg).

9. Bréguet biplane, No. 9176. Motor, 220-h.p. Renault No.
 54281 (12-cylinder). Crew: Lt. Neumann, pilot, taken prisoner,
 Sub-Officer Vitty, bomb-dropper. Shot down by ground defence,
 by Buggingen, 3 kilometres to north of Mülheim.

"Flugsport" also says:—

"A specially interesting point in this list is the proof that an
 American Aeroplane Squadron took part in this attack, whereby
 a number of the most clever American aviators lost their lives,
 viz., Norman Prince, part-founder of the American Flight League
 in France; and, further, aviators Chapman and Rockwell. Inter-
 esting is, too, that one of the apparent best French Flight-stars,
 Adjutant Baron, was also killed in this raid."

The following casualty list has been compiled of German avia-
 tors killed and captured during September and October from
 "Flugsport" and other sources:—Capt. Günther von Detten, one
 of the eldest German military pilots, who took his brevet on a
 Rumpler-Dove in 1912, and afterwards carried out long cross-
 country flights, killed. Officer Replacé Paul Bodenberger, killed.
 Dr. Harald von Bieler, an early Euler pilot, taken prisoner as
 Lieutenant of the Reserve, by the Russians, and sent to Siberia;
 Lt. Philipp Cherdron, killed; Lt. Max Sedlmayr, killed (not to
 be mistaken for the well-known civil Wright pilot, Gerhard S.,
 during the war a Lt., too); Lts. of the Reserve Fahbusch and
 Rosenkranz, killed; Lt. of the Reserve by a Bavarian Feldflieger
 department, killed; Lt. Gustav Ritzert, killed; Lt. Mulzer, killed.

* * *

In the night of Sept. 6th the biggest part of the Luftfahrzeug
 Gesellschaft Aircraft Works in Adlershof were burned down. As
 far as could be ascertained 6 or 7 aeroplanes ready for delivery
 and 10 fuselages were destroyed. Preparation was made to re-
 start the manufacture in other places. The Luftfahrzeug Com-
 pany is well known as manufacturers of "Roland" aircraft.

* * *

The Holten aerodrome, having for a long time not been used,
 the German "Flying School" has now settled there, practice being
 given on Albatros biplanes, Hausmann being instructor. The
 former "Eichwalde" Flying School has been taken over by the
 "Centrale für Aviatik, Ltd.," at the Johannisthal aerodrome.
 Instructors are the German Kruger and the Bulgarian Schreff.
 Albatros and Rumpler biplanes being employed.

* * *

The German communiqué of Oct. 4th reports a daring aerial
 feat. The Vizefeldwebel Windisch landed Lt. von Cossel behind
 the Russian lines, who then walked along the bank of the Rowno-
 Brody railway and blew the line up at different points. He after-
 wards hid at an arranged point, where he was duly re-transported
 by the aeroplane.

* * *

"Flugsport" quotes the Russian paper "Rubkiji Wjedomosti"
 for the news that all of the 8 Russian Voluntary pilots fighting in
 the French Air Service have fallen in engagements on the French
 frontier. The last of these Russian Volunteers, Lt. Wittmann,
 was shot down by a German aviator at Verdun; his father, a
 retired General in Moscow, committed suicide on hearing this.

* * *

An English Flight-Captain who had succeeded in escaping from
 the Officers' Imprisonment Camp in Clanshal was captured on
 the Dutch frontier by a Landsturm sentry and returned to this
 place.

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THE AIR SERVICES AND THE PRESENT CRISIS.

BY "BERKELEY."

Wartime is in England the season for reform. To prepare adequately in the days of peace is expensive, and the figurative balance-sheet, so dear to the sovereign people, shows no immediate gain. Expenditure on the Navy is permitted unquestioningly in gratitude perhaps for her policing of the roads of commerce. But the largeness of the Naval Estimates satisfies the country, and the efficient spending of the money is not ensured at all. The Army is thought to be an expensive luxury, a little obsolete in its methods, perhaps, and too completely officered by gentlemen to be entirely worthy of trust. Thus, the defences of the nation drift on until war comes unasked for and unwelcomed by the House of Commons. War brings enlightenment, and the people who have slept so long, awake, and, with renewed vigour, undertake the reform of the wrong things in the wrong manner.

The Royal Flying Corps is now thought worthy of reform at the hands of an awakened England. In 1912 it was brought into being by an Under-Secretary of State for War possessed of a vivid sense of dramatic imagination, and no knowledge of the military needs of either the Army or the Navy. He, with others, dreamed of a day when a Third Service devoted to the Air would be brought into being, but he spared but little time to the urgent needs of the present. With the Third Service in view he gave a semblance of unity and a certainty of ruin to the Royal Flying Corps by combining within its original organisation the aerial arms of both the Army and Navy. It was to be administered by officers from both Services. In this very attempt at unity lay the seeds of failure. The two Services cannot work together as one body.

From the beginning there was little sympathy between the two Wings of the R.F.C., and in 1914 Mr. Churchill re-named the Naval Wing, R.F.C., the Royal Naval Air Service. Since that time the Army and Navy have managed their aeronautical arms on entirely divergent lines.

This separation should in the nature of things have led to ultimate success had it not been for an entire misconception of its duties on the part of the Royal Naval Air Service. Had the Air Department at the Admiralty confined its attention to the needs of the Fleet present difficulties would not have arisen.

The development of the seaplane and of the airship, and all that such development implies, should have controlled the energies of those in whose charge fell the direction of naval aeronautics. But the seaplane had not and has not advanced in design and performance so far as has the aeroplane produced for operations over land. Therefore, rather than work in obscurity, even though the cause was good, the Royal Naval Air Service purchased a large number of aeroplanes of similar attributes to those used by the Royal Flying Corps. The great majority of naval pilots were, in consequence, trained entirely for work over land. This divergence from the proper duties of naval aviators was not due in any way to ignorance, but was closely related to a desire on the part of certain officers not to miss such advertisement as the public prints could give to those who flew.

Thus did the Naval Air Service trespass on the sphere of influence proper to the Army. Little trouble came of this while peace lasted, but when war broke out the situation became highly strained. The Royal Naval Air Service could give little or no assistance to the fleets at sea, and it had no specific duties to perform ashore. A few of its pilots were used in acts of gallant piracy in France, which, while they caused, by their lack of military orderliness, much anxiety and annoyance to the German troops, were of many degrees less effectiveness than the effort warranted. Such personnel possessed no military knowledge, nor—a worse deficiency—had they any sympathy with military ideas. That was in the early days of the war. To-day it is not proper to speak in detail of their present duties. It is sufficient to observe that they are, despite the energy and courage displayed, of but little military value.

While the Naval Aeronautical branch thus trespassed ineffectively on the Army's field of duty, the Royal Flying Corps was deprived of both personnel and matériel that would otherwise have been available. Every man and aeroplane available for service is of the highest value, and day by day the sphere of action of the Royal Flying Corps widens beyond the resources at hand. Instead of the pleasant rivalry of two competitors for the laurels of courage and efficiency there exists a more deadly rivalry in the thirst for ultimate domination. There is no splendid appreciation of the rival's success. All that is killed by jealousy on the one side and contempt on the other.

The first few months of the war began the feud, and since then each has striven to obtain advantages over the other Service in the matter of matériel. New engines and new aeroplanes have all been prizes in this unseemly scramble. A new engine of high efficiency would be designed and constructed. One or other of the Services would then place a large contract entirely excluding the other Service—and this in a period of war! Yet, withal the Royal Flying Corps, working consistently in its proper routine

as a unit of the Army in the field, had need of all that could be obtained.

The indefinable but not the less powerful tongues of scandal spread such news among those who had some influence in the Government of the country, and the Air Board was brought into being, under the direction of the Earl Curzon, whose record of intelligent obstinacy indicated his fitness for such a post. Strong in personality and feeble in executive power, the new Board was to rule by suggestion—a modern Mesmer undisturbed by revolution. The conflicting elements in the policies of the Naval and Military Flying Services were to be removed, and a co-ordination of duties was to follow. The supply of matériel was to be regulated that neither Service should achieve a commercial victory at the expense of its rival.

In effect, the Air Board has achieved nothing tangible, owing to its entire lack of executive power. From a directing influence it has fallen to be an advertising agency of little importance. Its component parts have thought and have prepared a summary of representations that the Government may take action. The ostensible cause of failure is the refusal of the Admiralty to deal with or be advised by the Air Board. The real explanation possibly lies in the principle involved.

There are three methods in which the question of military aeronautics may be settled:—

i. By the formation of a single Air Service, which will concentrate within its organisation all aeronautical duties for both Army and Navy. Personnel would be allotted for duties with the troops in the field and the fleets at sea. Long distance bomb raids would be made as a part of an aerial strategy with or without the approval of the Naval and Military Authorities, but necessarily with the consent of the War Committee.

ii. By the formation of a third Air Service, in addition to those which are units of the Army and Navy. To this third Service would fall such duties as popular politicians would consider to be outside the Naval and Military spheres of operations. "Bombing Berlin," "A visit to three Fronts by Air," and such like incidents, would form a part of the work to be done by the Third Service.

iii. By the reorganisation of the existing Services in such manner that all aeronautical duties are divided between the aerial units of the Army and Navy. The Royal Naval Air Service would then concentrate on seaplanes and airships, only retaining sufficient over-land aeroplanes for coastal operations in connection with the Fleet. Long distance bombing raids and work of a similar nature which have become identified with the Navy through that Service's lack of proper aeronautical duties would be carried by the Army as a part of the general strategy of the campaign. Thus, all overlapping is avoided, and there is no wastage of effective aircraft in work of minor importance.

The third method is that which has most points in its favour as a measure of reform during the war. Either of the other schemes involve fundamental alterations requiring time and much experimentation before any degree of efficiency could be ensured. Circumstances are not favourable at present for the proper consideration of any great new organisation, and revision is all that can be done with effect. Under the third scheme the rivalry in regard to munitions would die away as the types of machines required would differ in both the Army and Navy. Some competition would exist in the purchase of engines, but that would be eliminated if an exterior department controlled the supply.

A part of the duties of the Air Board was the controlling (by suggestion again) of supplies. This duty might well be handed over to the Ministry of Munitions, a department which is not lacking in power, and despite its immense staff is capable of working with efficiency when necessary. The Royal Flying Corps and the Royal Naval Air Service could indent on the Ministry, and the matériel would be issued in order of urgency.

The various firms constructing aircraft for the Government would receive orders from one authority, and each would specialise in so far as possible on a type laid down by the Ministry. All designs submitted by the Services would be codified by the Ministry, and issued later in the form of blue prints with a minimum of those errors for which the Service draughtsmen have in the past earned undying fame. Thus would happiness penetrate into strange places.

That section of the Air Board which advertises by means of isolated letters of the alphabet and the style of a "Daily Mail" leader-writer those pilots of the R.F.C. who have done their duty during the preceding few weeks could with advantage cease to exist. Its duties need not be transferred to other departments, but simply to oblivion.

In such a revision it would be necessary to transfer from the R.N.A.S. to the R.F.C. the greater part of the aeroplanes, and probably half the personnel at present in use by the former unit. While the seaplane progresses to efficiency assistance in patrolling should be furnished by the Royal Flying Corps.

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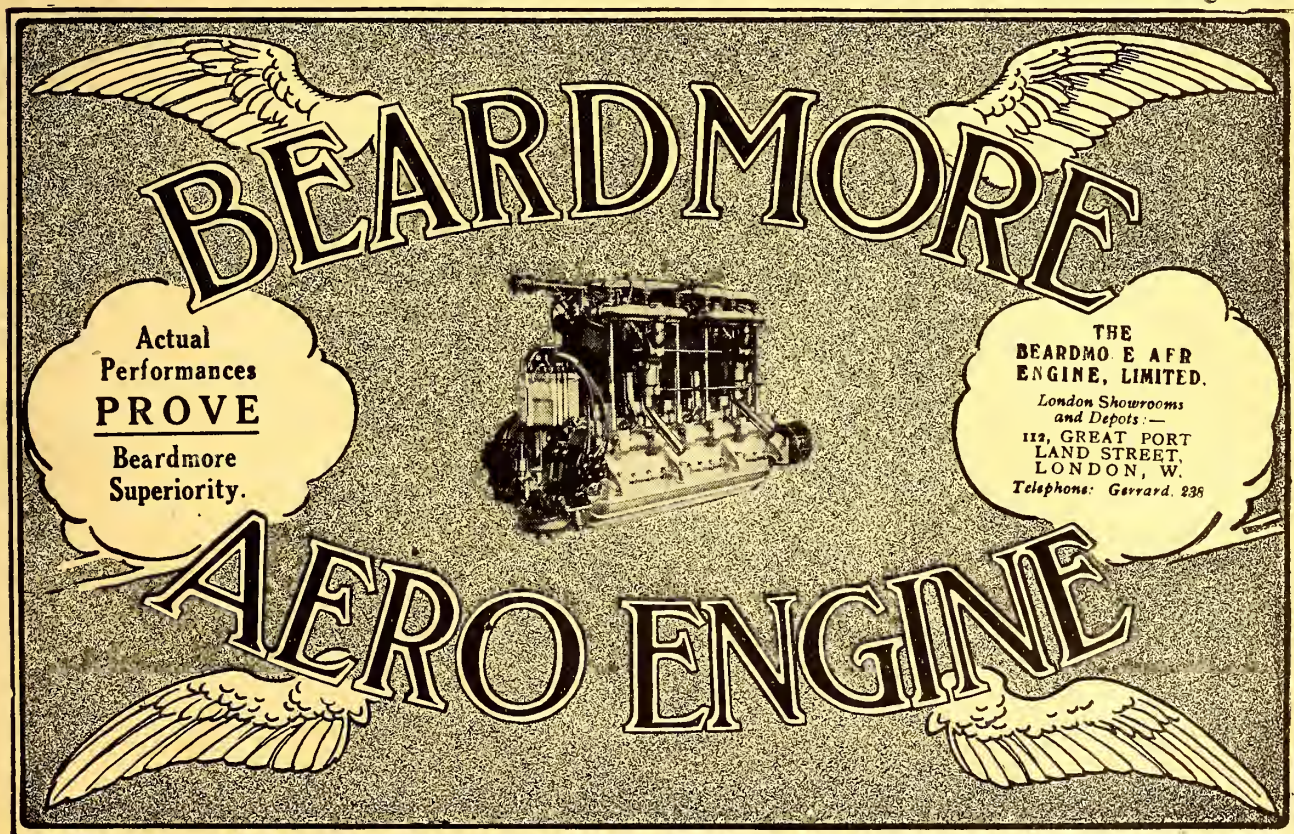
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THE LATE CEDRIC LEE.

Among the casualties reported this week is the death of Sub-Lt. Cedric Lee, R.N.V.R., who was apparently killed in the attack by the Royal Naval Division at Beaumont Hamel. Mr. Lee's name is well known to everybody concerned with aviation as the inventor of the curious monoplane which was known to the public through the lay press as the "secret circleplane," and which was jestingly nicknamed "the doughnut" by aviators in general.

Mr. Lee was the son of a wealthy Yorkshire business man, and at quite an early age had himself shown remarkable business ability. However, some six or eight years ago he became keenly interested in aviation, and as a result of various experiments with models he evolved the curious quoit-shaped planes which ultimately became the subject of so much controversy—both among practical aviators and among theorists. He gave up his interest in his family's business and devoted himself entirely to experiments with this curious machine, which certainly gave extraordinary results in gliding tests on the Yorkshire moors.

Later Mr. Lee located himself at Shoreham, and formed himself into a company in which several wealthy and notable people were interested. His experimental machines were built in the greatest secrecy, and this secrecy itself brought more than a little ridicule on the experiments. Two or three experimental machines were completed and smashed up one after the other. It was, however, proved that the machine could fly, and though it never had any prospect of excelling other aeroplanes, either in efficiency or stability, it was above the category of purely futile experiments.



The late Cedric Lee—Sub-Lt., R.N.V.R., and formerly aeronautical experimenter.

Cedric Lee deserves to be remembered more for his wonderful enthusiasm and his belief in his invention than for any actual results achieved by his machine. He was of the type of fanatical enthusiast who, although frequently misguided, actually does more to stir up public interest than those who work on more orthodox lines.

Early in the war, seeing that nobody wanted his aeroplane, and finding that apparently neither of the Flying Services wanted him himself, he enlisted in the Royal Naval Division as a seaman. Later he became a Petty Officer, and was finally given a commission, which promotion his gallantry fully justified.

He carried into the Royal Naval Division the same enthusiasm which he had shown in his flying experiments, and deliberately enlisted so that he should know his job from the beginning, though he might have had a commission for the asking without going through the ranks. Though never exactly what one could call a popular man he impressed his personality strongly upon all who knew him, and many members of the Royal Aero Club will deeply regret his fate.

FURTHER QUESTIONS IN THE COMMONS.

On Nov. 27th Mr. Pemberton-Billing (Hertford, Ind.) asked the First Lord of the Admiralty whether there was any other reason than a desire for accuracy in delaying the publication of the Admiralty communiqué on the enemy destroyers' raid on Ramsgate on Thursday night until after the publication of the German official statement.

Dr. Macnamara (Camberwell, N.), who replied, said: There was no other reason.

Mr. Pemberton-Billing: Are we to understand also that it is necessary to wait for the German official communiqué before the Admiralty can make up its mind as to the result of the raid?

Dr. Macnamara: No, Sir. The German destroyers appeared on the north end of the Downs during the night of November 23rd and 24th. Our communication was issued on the afternoon of the 25th, and had no reference whatever to the issue of the German communiqué.

Mr. Pemberton-Billing: I wish also to ask the right hon. gentleman whether he has any information as to the part played by the German Air Fleet during or immediately preceding the raid, and as to what part our Naval Air Service took, if any, in the action?

Dr. Macnamara: The answer to the first part of the question is in the negative; and the answer to the second part is, None. (Laughter.)

Mr. Pemberton-Billing: Has the attention of the right hon. gentleman been called to the fact that although we have many naval air squadrons, up to quite recently they have been absolutely and definitely forbidden to drop bombs on Zeebrugge, and whether it has only been by repeated representations by wing commanders that the Admiralty have been persuaded to allow them to do so?

The Speaker: That does not arise out of the question.

THE R.N.A.S. COMFORTS FUND.

The cash contributions to the Fund this week are very satisfactory, and it is to be hoped that the present cold spell of weather will induce the kindly minded to improve the amount for the forthcoming week. Contributions are needed *at once* so as to be in time for Christmas.

The following letter has been received from a Squadron Commander, R.N.:—

"Very many thanks for the R.N.A.S. comforts you have so kindly sent here.

"They will be greatly appreciated, especially by the members of my East African draft, a good many of whom are here."

The following cash contributions have been received during the week:—Anon, £10; Anon, £10; Mrs. R. Groves, £7 2s.; Mrs. Bruckersbury (?), £2; Mrs. Bytterssea, £2; Mrs. Elder (collected), £1 5s.; Mrs. Thompson, £1; Mrs. Mawson, £1; Mrs. S. B. Stuart and Miss Fullerton, 10s.; B. B. S., 2s. 6d.

Total, £2,094 11s. 8d. Further contributions in cash and kind should be sent to Mrs. Sueter, The Howe, Watlington, Oxon.

S.P.A.D.

A note appeared in the first page of the leading article last week giving an explanation of the meaning of the initials S.P.A.D. M. Norbert Chereau, of Blériot Aeronautics, points out there was an omission in the explanation. The present interpretation of the initials is Société Pour Aviation et Dérives, although the version Société Pour les Appareils Deperdussin was current in the early days of the firm's existence.

The history of the S.P.A.D. is not without interest. At the time of the incident which resulted in the incarceration of M. Armand Deperdussin the affairs of the Deperdussin Company were placed in the hands of a receiver, and, later, M. Louis Blériot bought the plant and works in Paris as they stood, and founded the S.P.A.D. firm. He arranged with M. Béchereau, formerly designer for the Deperdussin Company, to take up the position of Works Manager of the new concern, and the Spad biplane, as it is now known, was the creation of this move.

It is interesting to note that Blériot Aeronautics has now merged into a new Company to exploit both the Blériot and Spad rights in the British Empire.

CONGRATULATIONS.

FAIREY.—On Tuesday, Nov. 21st, at Grove Cottage, Iver, Bucks, to Mr. and Mrs. C. R. Fairey, a son (Richard).

Mr. C. R. Fairey is the Managing Director of the Fairey Aviation Co., Ltd., and was formerly assistant to Mr. Horace Short, and to Mr. J. W. Dunne. He was an early experimenter in inherent stability.

* * *

HUTCHINSON.—On the 21st instant, at Westholme, Teddington Park, Teddington, the wife of Douglas C. Hutchinson, of a daughter.

Mr. Hutchinson is the assistant manager of the British Aeroplane Varnish Co., Ltd., proprietors of "Titanine."

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AERONAUTICS IN THE UNITED STATES.

BY "OMEGA."

Lieut.-Col. George O. Squier, chief officer of the Aviation Section of the U.S. Signal Corps, has announced the preliminary plans for building up the army flying service for which Congress recently appropriated \$13,281,666. The plans provide that in addition to the officers and enlisted men of the Regular Army the aviation personnel shall consist of National Guard organisations mustered into Federal service, of civilians employed by the Aviation Section and of reserve officers and enlisted men of the Officers' and Enlisted Reserve Corps which President Wilson authorised on July 13th last.

The plans also provide for the training of 297 reserve military aviators and of 2,715 mechanics, truck drivers, etc. The preliminary training of candidates to the Officers' Reserve Corps will take place, after due examination by a medical officer, in private training schools; advanced training will be given at the Army aviation schools of San Diego and Mineola. If the candidate is successful in passing the R.M.A. test—which is less difficult than the junior military aviator's test prescribed for officers of the Regular Army—he will be commissioned a First Lieutenant in the Officers' Reserve Corps (O.R.C.). He will then be required to report for instruction and practice 15 days in each year at one of the Army flying fields, during which period he will receive the same pay and allowances as an officer of the same rank in the Regular Army.

The age limit for candidates to the O.R.C. is between 21 and 30 years; the candidates must be U.S. citizens.

The requirements for service in the Enlisted Reserve Corps are that the applicants must not be under 18 years nor over 45; they must be citizens or have made their declaration, and must be able to read and write the English language; they must pass the physical examinations and give two certificates of good moral character, and it is stated further that men with technical experience are most desired. The enlisted personnel is to consist of 2,715, divided as follows: Fifty-four master signal electricians, 190 first-class sergeants, 271 sergeants, 543 corporals, 1,381 first-class privates, and 276 privates.

The pay of these men for home service is as follows: Master signal electricians, \$75 a month; sergeants, first-class, \$45; sergeants, \$36; cooks, \$30; corporals, \$24; privates, first-class, \$18; privates, \$15. Additional pay is allowed for overseas service.

The term of enlistment is four years.

* * *

Someone "high up" in Washington—it is alleged—exclaimed one rainy day: "H—! the National Guard will never amount to anything!" These nine vigorous words raised quite a stir in circles which harbour particularly tender feelings for Militia organisations.

* * *

The Militia Division has issued orders, dated Sept. 8th, 1916, for the demobilisation of the First Aero Company and the disbanding of the Second Aero Company, both of the National Guard of New York.

The first company was mustered into Federal service in July last and went into camp at the army aviation school of Mineola; the second company was never mustered in for lack of equipment.

The First Aero Company's equipment of four aeroplanes was almost entirely provided by the National Aeroplane Fund of the Aero Club of America; two more machines were later furnished by the Aviation Section of the U.S.S.C. (Incidentally, an "aero company" corresponds to a "flight" of the R.F.C., there being now three companies to a squadron, whereas formerly there were only two.)

* * *

The greatest mystery surrounds the fate of the Navy's training dirigible D.-N. 1 (which stands for "dirigible non-rigid") and there does not seem any likelihood of the veil being lifted very soon. As far as can be ascertained the D.-N. 1 was never blown away by a storm, the craft referred to by newspapers as a "dirigible" having been a kite-balloon pure and simple; reports of a trustworthy nature now state that the Navy airship has been inflated at the naval aeronautical station of Pensacola, but that efforts to make her leave the ground with the specified useful load have proven fruitless.

* * *

The Navy possesses, by the way, a very fine floating hangar for one small sized airship at Pensacola; the station is also fitted with a dozen permanent seaplane sheds and a hydrogen generating plant, where "H" is produced by electrolytical process.

* * *

The First Aero Squadron of the U.S.S.C., which is on duty in Northern Mexico with General Pershing's army, has now received its full quota of equipment. The twelve machines are 160-h.p. Curtiss tractors and mount one Lewis gun and two .351 Winchester automatic shoulder rifles each; 100 rounds are carried per gun. Bombs and an automatic camera make up the rest of the military equipment.

The Second Aero Squadron, stationed in the Philippines, has not yet been brought to full strength, only two companies being thus far organised; the matériel consists of 125-h.p. Hall-Scott-Martin seaplanes.

The Third Squadron, intended for service within the continental borders, is now being organised with headquarters at San Antonio (Texas); it will be composed of 200-h.p. Curtiss twin-tractors and will be commanded by Major B. D. Foulis, one of the oldest American military aviators.

Plans are also being perfected towards the organisation of the Fourth Aero Squadron (Hawaii) and of the First Kite-Balloon Squadron; the latter will consist of four kite-balloons, four officers and 80 enlisted men, and will be stationed at Fort Sill (Oklahoma).

So far the only military establishments of this country provided with kite-balloons are the U.S. Navy and the National Guard of Ohio, each of which possesses but one craft of this type.

* * *

The Aviation Section, U.S.S.C., has established the following letters of differentiation for the flying matériel: A (aeroplane), H (hydro-aeroplane), T (training machine), S (service machine). The identification mark will consist of a dark blue coloured five-pointed star.

The matériel of the U.S. Naval Flying Corps (such being now the official denomination) bears the following letters according to the type of machine: A (aeroplane, to distinguish from dirigibles (D), balloons (B) and kites (K)), which is followed by either L (land machine), H (hydro), B (boat), X (combination, land-and-water machine) or C (convertible machine).

Quite an elaborate system this is, by the way, for a further touch of algebra is furnished by the balloons B, which may be captive C or free F, the dirigibles whose character is judged by their being rigid R or non-rigid N (evidently no semi-rigid is contemplated) and by the kites K, whose family tree may go adorned by B (box type), C (cellular) or T (tetrahedral).

(One wonders how the following equation might be solved: $DR = X(AH + AB + KB)$ and whether $AX = AC$?)

* * *

The Navy Department has just let contracts for forty-nine seaplanes. It has twenty-six other seaplanes under construction, besides a dirigible balloon, the D-1, and two new kite balloons, making a total of seventy-eight aircraft units. At present the Navy's aeronautical equipment consists of only six seaplanes, a kite balloon, and two captive balloons. Other orders are to be let by the Navy for aircraft, including seaplanes and a dirigible, to cost about \$500,000 with its hangar.

The 49 seaplanes for which contracts have just been let comprise 30 training-school aeroplanes of the Curtiss type, 6 Sturtevant seaplanes, 3 school seaplanes to be built by the Standard Company, 3 school seaplanes by the Thomas Company, 3 school seaplanes by the Aero Marine Company, 2 twin-engine aeroplanes by the Thomas Company, and 2 seaplanes of a foreign type. Contracts have been let to the Goodyear Tyre and Rubber Company of Akron, Ohio, for two kite balloons, each to cost \$4,000 (£800). They are to be 81 feet long, 22 feet wide and weigh 1,080 pounds.

In addition to this order the Navy Department has built at the Washington Navy Yard a large twin-engined seaplane, known as the A.H. 18, which has recently made several trial flights.

Although delivery of the twenty-six seaplanes of eight different makes under construction for the U.S. Navy is overdue from one to twenty-two months, naval officers concede that part of the delay is legitimate, it being chiefly due to novel developments.

To quote them, these orders were given to various companies to encourage them to develop a satisfactory seaplane, one that would be both seaworthy and airworthy. As soon as such a seaplane is developed larger orders will be awarded by the Navy Department.

* * *

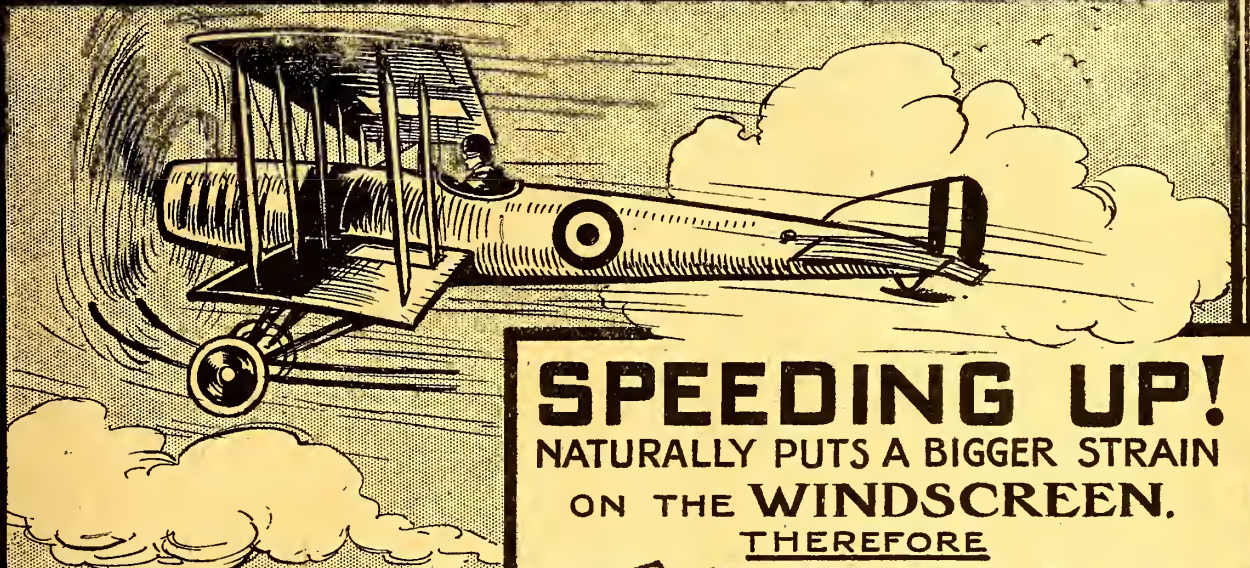
The Navy Department has decided to bar henceforth from its flying equipment seaplanes of the pusher type. This order implicitly excludes from the Naval Flying Corps the "flying boat" and the inherently stable "self-balanced" Dunne types.

* * *

Important experiments are to be conducted the coming winter at Guantanamo (Cuba) and Pensacola (Florida) with kite-balloons and seaplanes. The two kite-balloons now contracted for will be installed on the dreadnaughts "Oklahoma" and "Nevada" and will be tested in fleet manoeuvres under simulated war conditions. Both battleships are to be fitted with a hydrogen generating plant and other facilities for the handling of the kite-balloon. It is further intended to establish a seaplane scouting service which is to co-operate with the destroyer flotilla of the Atlantic Fleet.

* * *

The personnel of the Naval Flying Corps consists at the date of writing of 29 naval aviators of various ranks, 14 naval student aviators and 120 enlisted men detailed to aviation duty.



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Under the National Defence Act and the 1916 Navy appropriation the personnel of the N.F.C. will be increased to 150 naval aviators (officers) and 350 enlisted men; besides 30 acting ensigns (certificated aviators) and 150 student aviators will be appointed from civil life to the recently created Naval Reserve Flying Corps.

Authorisation was given on Oct. 20th by the Aviation Section, U.S.S.C., for the equipment of two additional aero squadrons. One of the squadrons will consist of pursuit machines; Curtiss triplane speed scouts will make up the matériel of the first company, while the second company will be equipped with Sturtevant 140-h.p. one-and-one-half-plane speed scouts. No contracts have as yet been passed for the equipment of the third company; but it is rumored that the Wright-Martin Corporation will get the order.

* * *

Capt. Charles de F. Chandler, U.S.A., the veteran military balloonist, has been appointed commanding officer of the newly formed Aerostatic Division of the Signal Corps.

The equipment of the Aerostatic Division will consist of free balloons, kite-balloons and a small training airship, as well as winch wagons and field generating plants.

As soon as trained personnel becomes available balloon companies will be organised and attached to the tactical units of the mobile army. Bids have been opened for two spherical and two kite-balloons. The old Army balloon plant at Omaha (Nebraska) will probably become the headquarters of the Aerostatic Division.

* * *

Orders have been signed by the O.C. the Aviation Section, U.S.S.C., for the immediate purchase of 150 seaplanes of a new type, more powerful than any hitherto commissioned, with which it is intended to equip the coast defences of the Atlantic, Pacific and Gulf Coasts.

Additional orders for the purchase of 175 service aeroplanes of all types and of a total value of £600,000, as well as for 100 more training machines, valued £200,000, have also been let, which tends to indicate that the United States has begun to think furiously about its aerial defences.

* * *

Under the National Defence Act and the 1916 Army appropriation bill 148 officers and 1,200 enlisted men become available for aeronautic duty; at present the Army has 45 junior military aviators with a staff of 6 officers; 38 officers are under instruc-

tion at the aviation school of San Diego, where they are being turned out at the rate of eight a month.

The San Diego school has 11 training machines, mostly Martin biplanes, which are shortly to be increased by the addition of 18 seaplanes. The Mineola Army aviation school has six JN-4 Curtiss 100-h.p. machines, and is to receive twelve more. The third Army aviation school, located at Ashburn, near Chicago, which has just been inaugurated, is now being equipped with school machines.

* * *

Victor Carlstrom's mail-carrying sunrise-to-sunset flight from Chicago to New York, which had several times been delayed owing to minor troubles, was launched on Oct. 2nd under the auspices of the "New York Times."

Although the flight did not hold all it promised, Carlstrom travelled half the distance, 452 miles from Chicago to Erie, Penn., in 4 hrs. 17½ min., thus making an average speed of 105 m.p.h., which establishes a new American (non-stop) cross-country record.

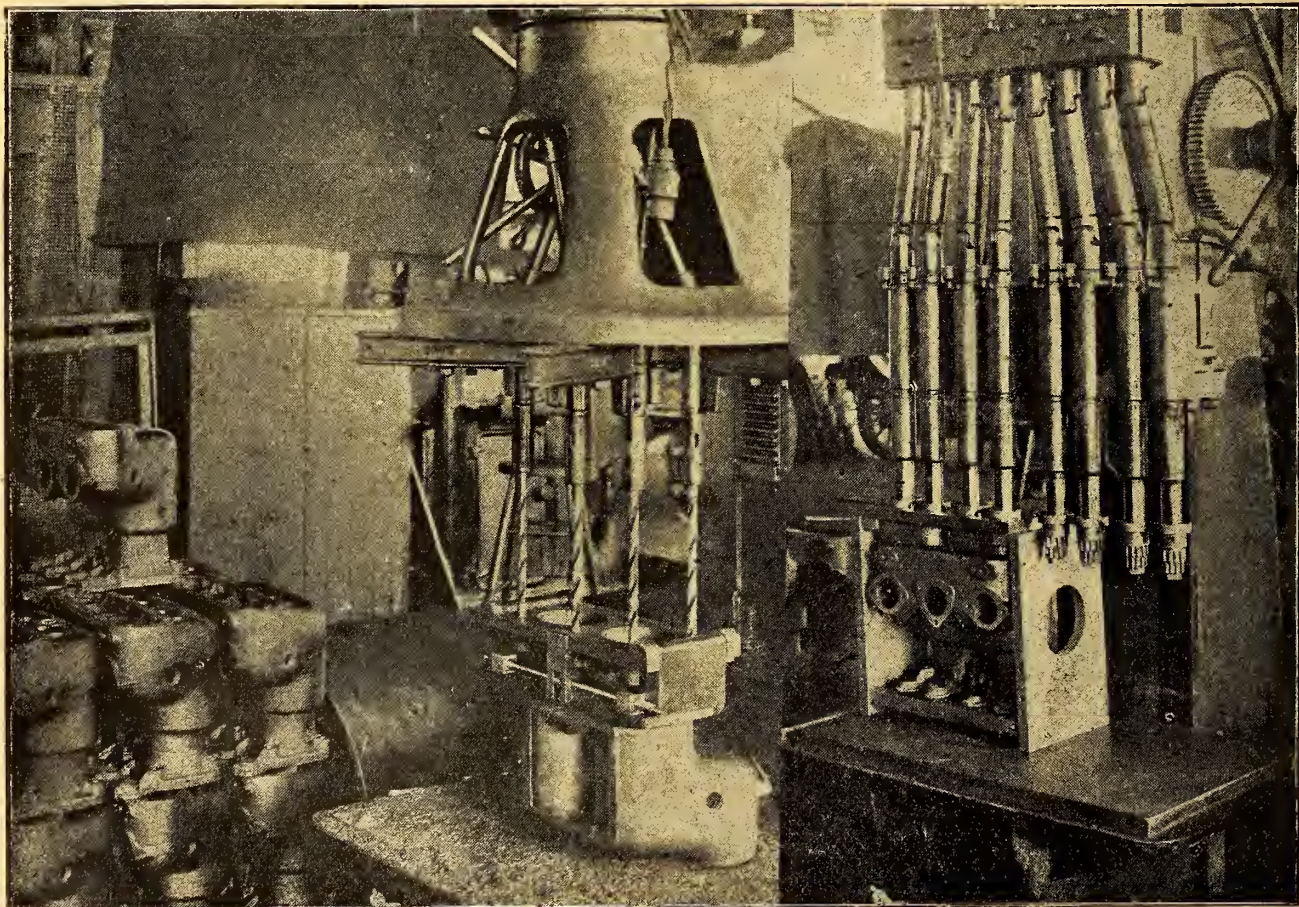
"It was only a loose nut, corrected later by a single turn of a wrench" (to quote the "New York Times"), which caused him to land at Erie, Penn., when he found out his gasoline tank was leaking through a loosened feed pipe.

Nevertheless "the single turn of a nut" took three and one-half hours, because Carlstrom had to fill up his tank again, and no petrol appears to have been on the spot. As a result the aviator was unable to make New York before dusk and therefore decided to head for Hammondsport, the Curtiss cradle, where he landed at 4.24 p.m. to resume his flight the following morning.

He started from Hammondsport at 6.35 a.m. and arrived at Governor's Island, New York, at 8.55½ a.m., having travelled with a stiff breeze which enabled him to cover the distance of 315 miles at a rate of 137 miles an hour.

Carlstrom carried a goodly amount of mail matter, part of which is destined for Germany, and will be forwarded thither by the "merchant" submarine "Deutschland"—if she ever gets there.

As to Carlstrom's machine, it was a modified R-4 Curtiss model with 160-h.p. motor, and with an additional centre panel which increased its span to 60 feet. The special petrol tank that was fitted for the Chicago-New York flight holds 208 U.S. gallons. Its weight all on was 3,750 lbs.



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The stages of the journey may be tabulated as follows:

Left Chicago (E. T.)	Oct. 2nd	7:09:30 a.m.	
Arrived Erie	11:27:00 a.m.		
Left Erie	2:34:00 p.m.		
Arrived Hammondsport	4:24:00 p.m.		
Left Hammondsport	Oct 3rd	6:35:00 a.m.	
Arrived New York	8:56:00 a.m.		
	Time	Miles	
Chicago to Erie	4:17:30	452	
Erie to Hammondsport	1:50:00	200	
Hammondsport to New York	2:21:00	315	
Flight time	8:28:30	967	

Average, 114 miles an hour.

* * *

Rear Admiral Peary, who was very enthusiastic over the Chicago—New York flight, presented Carlstrom with an Eskimo costume, which combines great warmth and light weight. It is a formidable looking thing of sheepskin, made up of wide flapping boots and capacious trousers, tied up at the waist with a cord, and a one-piece cap and coat. Carlstrom tested the costume—and the machine too—on Oct. 14th, near Buffalo; he made a 22 minute flight, climbed to 8,000 feet and came down apparently satisfied with his mount and shell.

A SUCCESSFUL AVIATION BUSINESS.

The war has produced a large number of new firms concerned with the manufacture of aeroplanes and their component parts, and in many cases the attempts to start up in an entirely new form of business have had results amusing to the onlooker, but somewhat tragic to the people most concerned. Such a difficulty is likely to arise when the principals have aforetime been concerned with the manufacture of ordinary hardware, or, perhaps, of packing-cases, or of furniture of the type found only in fourth-rate hotels and in "artistic" villas in Norwood, and whose case-hardened employees hanker to mortise interplane struts into spars because it looks nicer than the use of sockets.

Of course, this sort of embarrassment does not arise when a new factory is created by people who have been long in the aviation industry. A notable example of this type of factory, which has arisen in a few months' time, and which for something like a year has been hard at work on the production of aircraft of various types, is found in the Fairey Aviation Co., Ltd., of Hayes, Middlesex, an institution which has reached in some few months a stage of efficiency which in peace-time would hardly seem possible after a lapse of years.

The Fairey works presents an imposing appearance from the outside, and naturally covers a considerable extent of ground, its situation lending itself to the easy transport of raw material and finished products both by rail, canal, and road.

It is, of course, impossible to give any particulars of the work in hand, but it may be said that it is of the most varied character. A walk round the shops reveals much careful thought in the arrangement both of the shops and of the work done in them. To avoid as much as possible waste of time in moving the work from the scene of one operation to the next, care has been taken to arrange everything so that the operative staff has easy access to all parts of the building without unduly departing from a beeline.

This successful condition of affairs has arisen through the workmanlike way everything has been done. Mr. C. R. Fairey, the principal of the business, has been fortunate in selecting an extremely capable staff of assistants, who vie with one another in organising their departments to produce the maximum output, with a beneficial result to the whole concern.

An excellent example of the way in which things are done is seen in the wood-working department. The timber-mill is situated next to the timber store, the first machine encountered being a band-saw which cuts up the planks into the required sizes. Next to the saw is placed the planing machine which faces up the wood on one side. After this operation it is passed on to a thick-nessing machine which reduces the board or batten, as the case may be, to exactly the size required. The timber then passes straight on to a spindle machine, where it is brought to the required form, and then it is ready for hand-finishing. After this is done the different wooden parts so made are passed into store ready for the erectors.

The difficult operation of building up control members of welded steel tube is successfully carried out by some very fine mechanics the firm employ, including certain soldiers who have been detailed from general service to work as mechanics.

Every care is taken to reduce the risk of error to a minimum. For instance, the holes for the holding down screws which attach the sockets to the spars, are drilled accurately with the aid of a standard template before ever the spar reaches the erector's hands, and he can have no doubt as to the exact place of attachment for the parts he handles. The number of templates used throughout the wood-working department is very great, and involves consider-

able expense, but the amount of labour their use saves must be well worth the trouble of their production.

The firm is fully equipped for the manufacture of every sort of aeroplane, and the different shops are engaged on multifarious types, for besides Mr. Fairey's own designs, work is in progress on big contracts for standard designs, and there is a capably run repair-shop, where both Naval and Military machines are rebuilt after being smashed, and are turned out in some cases considerably better than when new.

Among the aircraft under repair are a number of machines which have been damaged on active service abroad, as well as one or two which have assisted to make history in this country in a manner which need not be specified. It is sufficient to say that, when the mission which these particular aeroplanes had fulfilled became known, it was almost as necessary to guard them from relic-hunters as in the case of certain German airships brought down in England.

Credit is due in no small measure to Mr. Fisher, the works manager of the company, for the high state of efficiency reached by the firm, and there seems no reason why the output should not increase steadily so long as there is any demand for aeroplanes—and it is not likely that the campaign initiated by a writer in a leading London paper that flying in all its branches should be *verboten* after the war will succeed.

Mr. Fairey was for some years with the Short Bros. as designer, and only left to start in business for himself. Prior to joining the Short firm he was doing both theoretical and practical work on the Dunne inherently stable biplane. He has been closely connected with aviation since its earliest days, and when quite juvenile made a series of highly informative experiments with models in an endeavour to discover the secrets of stability, a work in which he was particularly successful.

Unlike many aeroplane designers, Mr. Fairey is equally capable in handling figures, designs, material, and men, and, as a result, the Fairey Aviation Co. should have a highly successful future.

SOME NEW COMPANIES.

"Nieuport" and General Aircraft Co., Ltd.—Capital £200,000, in £1 shares. First directors: Sir Inigo Thomas, G.C.B., Geo. C. de Wilde, Henri Kapferer, Gustav de Lage, and F. Lane.

Smith's Static Motor, Ltd., Caxton House, Westminster, S.W.—Capital £100, in 2s. shares. Aeroplane engine and motor manufacturers, etc., acquiring interests in patents, etc., relating to aeroplane motors or engines. First directors: H. Heenan, T. H. Duffell, A. Smith, C. Schofield, and Major Taylor.

Standard Valves, Ltd.—Capital £5,000, in £1 shares. Acquiring business of manufacturers of and dealers in valves for aeroplanes, motor-cars, etc., carried on at Standard Works, Balmoral Road, Northampton, as the "Valve Syndicate." First directors: D. Barratt and D. H. Gainsford.

S.Y.S. Engineering Co., Ltd., Leeds.—Capital £1,200, in £1 shares (600 6 per cent. cumulative preference), manufacturers of component parts of machinery, aircraft, and munitions of war. First directors: A. Yewdall, A. Smith, and Major Sheldon.

Traction Development, Ltd., Hampden House, Kingsway, W.C.—Capital £30,000, in £1 shares (10,000 7½ per cent. preferred ordinary), manufacturers of locomotives, traction engines, motor-cars, aeroplanes and all heavier-than-air flying machines, and fittings for the same, etc.; under agreement with R. F. Macfie and Macfie and Co., Ltd. First directors: F. Macfie and H. F. Smalman-Smith.

A MUNITIONS MOVE.

The Minister of Munitions has appointed a Committee, under the chairmanship of Mr. C. W. Fielding, to advise him upon the steps which can be taken to secure the most economical use of the metals required in the manufacture of munitions of war.

One method is so to control the output of aircraft that there will be few rejects and scrap parts made, and fewer things ordered which are of no use. In this way a vast amount of specially expensive metal can be conserved.

A BUSINESS MEETING.

On Tuesday, November 28th, the 12th ordinary general meeting of the Sunbeam Motor Co., Ltd., was held at the Victoria Hotel, Lichfield Street, Wolverhampton; for the purpose of the re-election of Messrs. S. Bayliss and T. Cureton, two directors, who automatically retired. The auditors, Messrs. Smith, Son and Wilkie, were also re-elected.

A CHANGE OF ADDRESS.

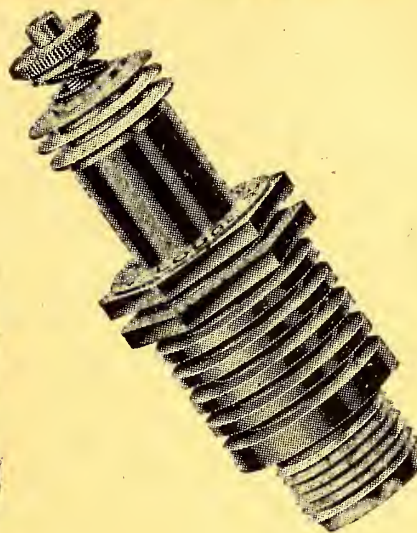
Mr. Leo Harris, manufacturers' agent to the Motor and Aviation Industries, whose offices have been situated at Temple Chambers, Lichfield Street, Wolverhampton, has now removed from that address to Grosvenor Chambers, Lichfield Street, Wolverhampton. Telephone: "743 Wolverhampton." Telegrams: "Petroleo, Wolverhampton." Mr. Harris's London office is at 110, Cannon Street, E.C. Telephone: "City 3456 and 7."



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Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

THE PILOT'S OWN.

As we have already seen from certain examples—notably such a motor as the Beatty—the prospect of quality always starts hopefully in the case of a pilot's own production. He at least knows more or less what he wants, and the special nature of the proposition which is something to build upon. More, he knows what he does not want, and will not have. Which is an even more useful foundation, because as a negative it balances the positive.

The only problem is how to get the one, and eliminate the other, to the best advantage, but at least it starts fair.

And so starting, there is really no magic in any four-stroke proposition. There are no actually novel discoveries to make, on the physical side. Some of the most valuable have been neglected, or wholly forgotten, so they remain obscure—as we saw in the case of the pure gas-engine practice of the Duesenberg and in many other instances—but at least they have been learnt by somebody at some time or other. Mechanical details—subordinate to physical of course—on the other hand, are largely, a matter of practice, the mass of which is quite well known, and may be trusted to follow. Quality, merit, and success generally, in this

case, are chiefly matters of personal ingenuity, chiefly based upon the degree of comprehension of the physical aspects.

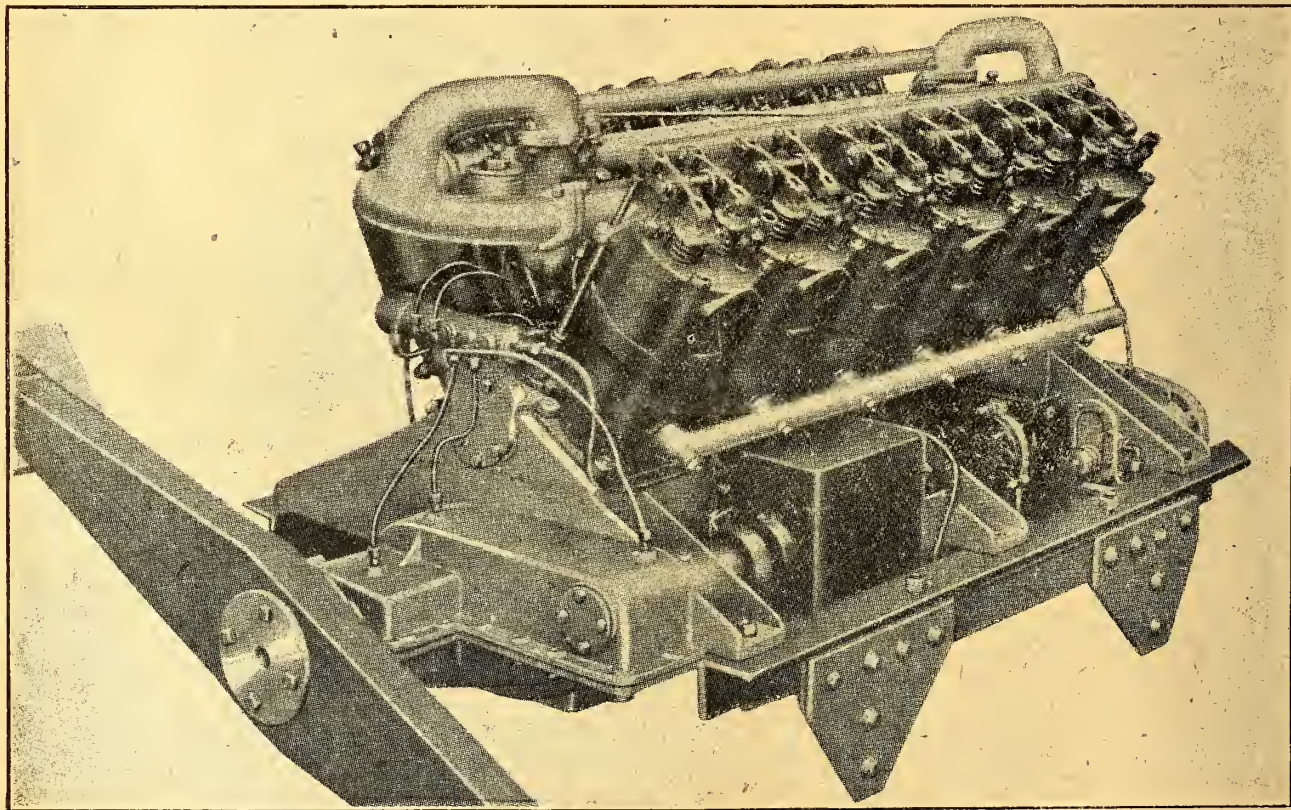
That is why the outcome in the case of the pilot's motor is so prospectively favourable. It may not represent the last efficiency, physical or mechanical—which is all to the actual designer's equation—but at least it can be trusted to be reliable, and probably simple; also to possess most, if not all of the essentials, in the way of installation, accessory and appropriate fitment.

MR. ATWOOD PRESENTS.

As I see it, therefore, it is solely upon these conceptions generally that one can base criticism fairly.

As in the Beatty then, so in the much larger twelve-cylinder V-type motor designed—or rather produced—by that well-known American pilot, Mr. Harry N. Atwood, of Williamsport, Pennsylvania: which gives from 120 h.p. to 180 h.p. from its normal of 2,000 to its maximum of 3,200 r.p.m.: the fact that it can be run at the latter speed at least showing that its mechanical quality ought to be sound enough.

The measurements of four feet over-all length, two feet three



Propeller end of the 120-180-h.p. Atwood Motor.

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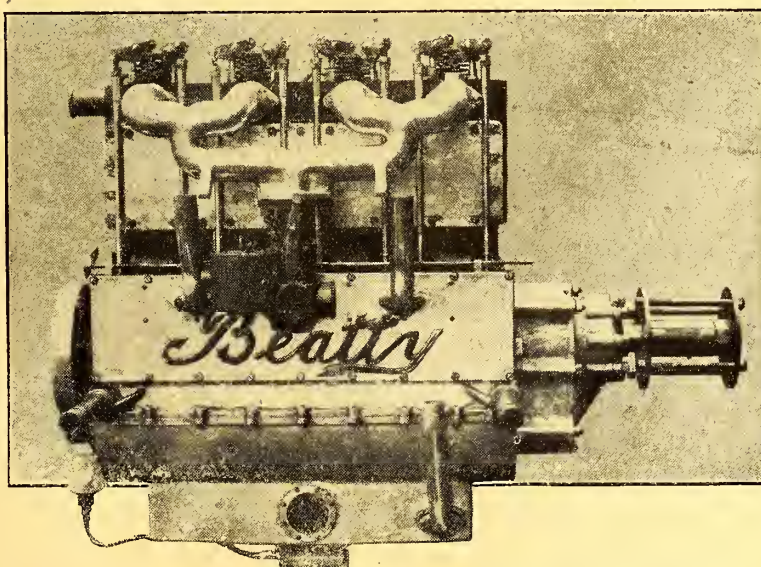
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inches high and an inch less in width, are certainly not excessive, nor can the weight of 690 lbs. complete with its electric starter and dual ignition—which account for 90 lbs. of it—be regarded as above the average of water-cooled four-stroke aeromotors.

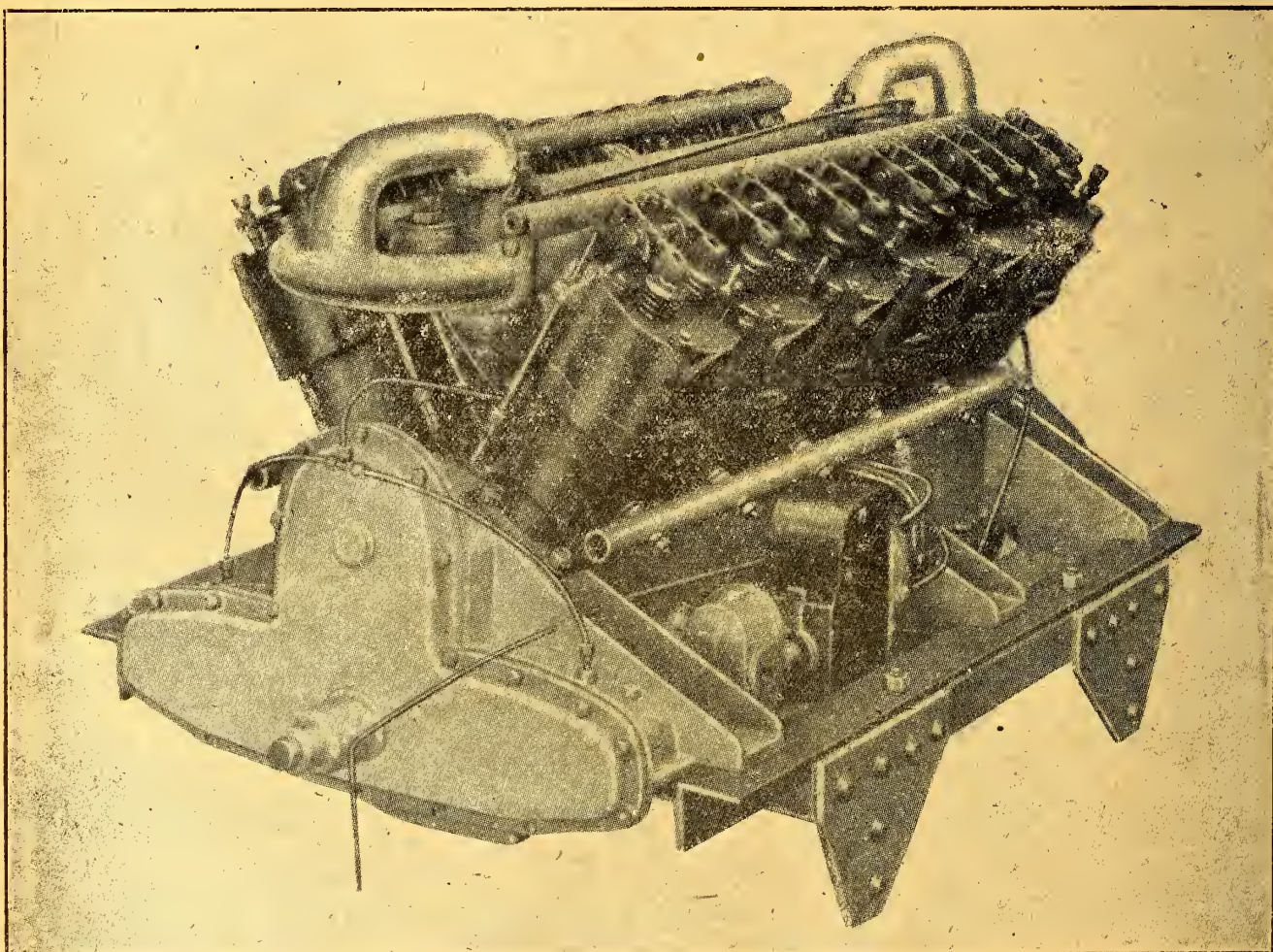
Coming then to the mass design, it is obvious at a glance that the Atwood "twin-six" has been specifically built, as claimed, for aircraft use. So much is patent enough—as the illustrations show—from the accessory lay-out. And we may admit the claim that it is not "a re-vamped design or of semi-adapted construction"—of an automobile type, at least. But that is the limit.

CERTAIN INEXACTITUDES: AND THE FACTS.

For what is re-vamping or adaptation. You might truly say that the entirety of four-stroke design consists of nothing else. The very best aeromotors in existence to-day represent nothing more than adaptations of gas-engine and marine motor design and mechanism; while some are even direct copies of special racing or touring car motors. As an instance, the Austro-Daimler is positively nothing more than the original Prince Henry and

Semmering model, slightly enlarged and elaborated. Many another good V-type is practically the same as the 200-h.p. Darracq; and only too many of them perpetuate its mechanical defects into aeromotor practice, which is the substance of my chief complaint.

We further see the first claim logically contradicted by the second—which on the present evidence is far more credible—that the Atwood "twin-six" is the result of years of study and practical application on the part of gas-engine experts and aeronautical engineers. True, doubtless. But since aviation of a kind requiring such motors literally did not exist years ago, one may assume that all this study and application was on general account, not on the Atwood, one as a far-off goal. Especially when we are further told that in working out this design, Mr. Atwood "employed the best gas-engine experts to make sure that his own requirements conformed with those which had previously proved reliable." What then is adaptation, if not this? In fact the wonder is that so many cooks did not spoil the broth.



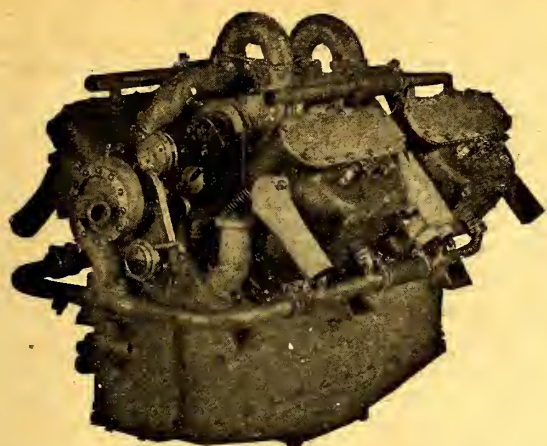
The Inner end of the Atwood Motor.

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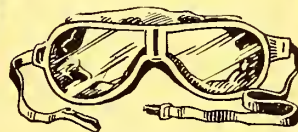
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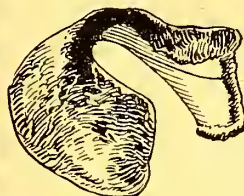
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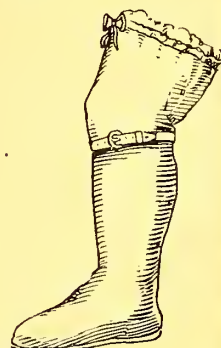
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Also, we are told that the motor is of the four-stroke cycle, because such motors "have proved to be the most economical in fuel, the most reliable and the least subject to atmospheric changes." Which is precisely not true. The conventional Day-type two-stroke motor with all its defects—the type with which America is full—has just as good a consumption record, and if anything has proved far less sensitive to atmospheric changes. And I do not hesitate to say that there is no four-stroke motor in the world that in common use even approaches the half-pint per horse-power hour which is the attested record of at least one British two-stroke motor.

Further we gather that the Atwood motor has twelve cylinders, because 12-cylinder construction shows by actual tests that internal and external vibrations are at a minimum and smooth running flexibility at a maximum, and that stress and strain on all parts are reduced to the least degree possible. Which is a statement of facts most deceptively calculated.

WHY THERE HAVE TO BE TWELVE CYLINDERS.

The actualities are these. The V-type, for a great many general reasons is the most convenient, the most capable of growth to greater powers. But, in the four-stroke cycle, the couple and vibration set up with any less number than twelve cylinders, is such that the motor would not only shake the life out of the aeroplane, but also its own. Literally, you are better off in this respect with a plain vertical of only six-cylinders. That's why.

This incidentally makes the further statement that the twelve-cylinder motor has proved itself "to have less internal resistance"—whatever that may mean, in the face of the fact that inertias and frictional surfaces are obviously greater—and "to have less weight per given h.p. than motors designed for the same h.p., yet with fewer or more cylinders," just so much deliberate rubbish.

Even more so is the final reason "because high speed motors have proved themselves least erratic to varying grades of fuels and densities of atmosphere." For this is precisely what has not been proved by practical experience. If anything, the contrary.

Frankly, it is all against the Atwood proposition that we must needs clear it of this entanglement of misstatement before we can see the thing as it is. Not the least of its merits, in my opinion, is that it seems so well able to survive and speak for its own actualities.

THE DESIGN IN GENERAL.

To start with, then, the Atwood design, in the mass—and this is one of its best basic features—is clearly an adaptation by wholesale of marine practice as far as may be: as is evident from its singly cast and mounted cylinders, with their separately-formed, detachable heads, bolted down to the cylinder castings with four bolts each, deeply tapped in the true marine style.

Then the valve-position, and its operation by tappets and rockers, is marine as much as automobile practice *per se*: and notably American convention for both purposes. That it should be, as a sheer adaptation, so well adapted to aeromotor work in this case, we perceive to be clearly because in the first place, all the valve-gear operation of the tappets from a single cam-shaft, is located inwardly of the V; and in the second place, because all the exhausts run outwardly, and the induction inwardly: thus, in the general fundamental lay-out, giving the design the best chances to make good, not only physically and mechanically, but for its special aeromotor purpose.

On the other hand—and obviously enough, from the illustrations—the crank chamber design, and the entire accessory lay-out, including the location of the electric starting motor, is distinctly an adaptation from such conventional automobile practice that one could name twenty cars which display the like. Nevertheless, it is a particularly useful one, and is perhaps the only respect in which such practice can be judiciously imported

into aeromotor objects; so that the selection is highly creditable to the eclectic judgment of the designer.

IN THE MATTER OF GEARING.

For the rest, the result is that there are few aeromotors in which the gearing—either aft for the cam-shaft above and the water-pump and one of the magnetos on the starboard side, or forward for the lubricator distributor above, and the electric-starter and the secondary magneto to port—is so well located and encased. My only question here, is whether the order and location should not have been reversed. One may just as well—in fact better—start a motor of this type from the after end of the crank-shaft as from forward, and since the forward end is the more exposed of the two, as a rule, why place such a vital part as a lubricator-system at that end?

Looking at the illustrations, too, do you see anything that looks like a reduction gear? or perceive any bulge, encasement, or any other trace of the burial of anything of the kind; in fact any evidence whatever of its existence? Neither do I, not the remotest. Still, there is one, and very cleverly devised at that. Most reduction gears, as we know, bring the propeller shaft above, and out of line with, the crank-shaft; thus necessitating extremely careful—and often at the best, makeshift—design of appropriate thrusts and bearings of sorts, not always adequate.

THE APPARENT ATWOOD WAY.

But in this Atwood design, examination of the forward end view indicates that within the detachable casing, a spur gear on the crank-shaft meshes up with a second spur gear—one of two on a stub-shaft, the second of which meshes back to a fourth one on the propeller shaft; the different ratios of these gears effecting the desired one to two, or any other reduction. But—you will notice in this case that the propeller shaft is brought positively in line with the crank-shaft, and is probably steadied or doweled into the end of it in some sort of socket or free dowel connection. So that only one strong double thrust bearing is needed. It will be obvious too, that should there be any desire to connect up the motor, as a single power unit to two propellers, that connection can be made directly enough, by simply removing the detachable casing and all the gearing therein contained.

It is true; there is no given official description of this device and "means whereby the ordinary intelligent person can construct the same" according to the regulations of Southampton Street. But my dear Watson, when you see a crank-chamber

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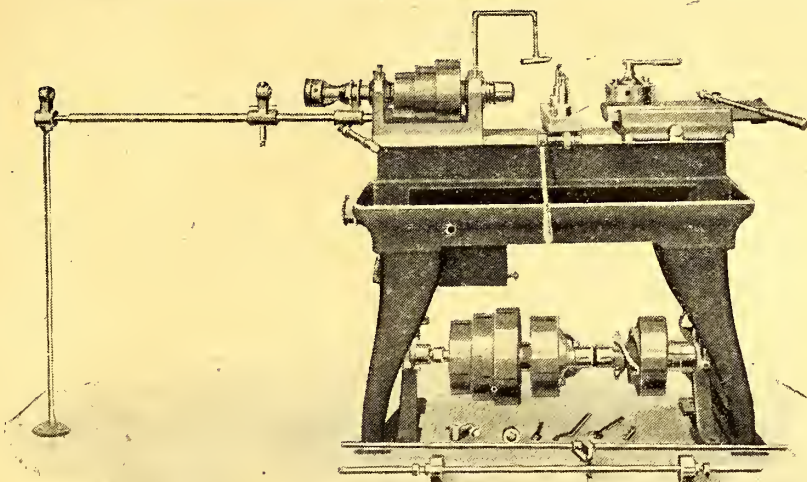
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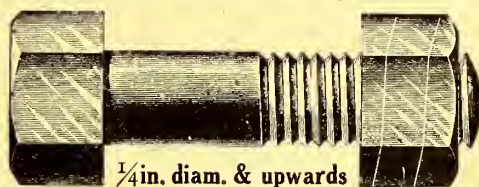
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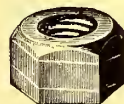
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end and gear casing in which there is room for nothing else than the obvious—if not only—sort of gearing that would effect this result and yet keep those necessarily independent shafts in line, you may take it that that device is there. It evidently seemed so easily obvious to the collar of good points for the Atwood design that they did not care to mention it. Still, the adaptation of a simple back-gear for this purpose is so novel in aeromotor design, that its explicit setting forth, as a feature of interest, might have been excused to the modesty of an American inventor.

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In his induction system, however, Mr. Atwood—or his proxy—is not so happy as he nearly was. The valve-arrangement specially permits, and the plan-view actually shows, a magnificent induction hoop in which the mixture can whirl around from cylinder to cylinder in an everlasting unhindered gallop, like the progress of a joy-juiced cow-puncher. The specification also states—and the picture shows how the connection is made, if you look closely—that the manifold is water-jacketed from the end cylinders to the carburettors, at each end.

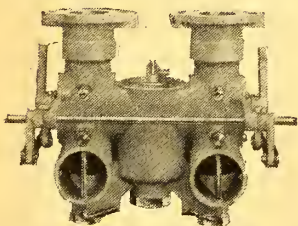
But—the point in these cases is, how does the mixture get

into that hoop; the practical ideal being the shortest way with the fewest bends, if any at all. However, that topside and every other view shows that this result has been wilfully, needlessly, escaped or evaded. It shows at each end, an abrupt bend right at the top of the carburettor; then another downwards, and two hard turns either way into the hoop. Whereas there was nothing to prevent those semi-circular, water-jacketed hoop-ends being formed in the normal every-day fashion of two-way mixture trunks; either cast uniform with the mixture-chambers, or flange-attached thereto, in the common way. And preferably from carburettors of the concentric float chamber type, in which you can get at the jet from the bottom, and need fear no unevenness of petrol-feed, whatever happens. Any sort but that too evident motor car one with the float chamber behind the jet, which in an aeromotor positively invites irregularity of mixture and induction. Preferably also, with a large screw cap above, so that jet-examination and replacement could be made absolute.

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(To be continued).

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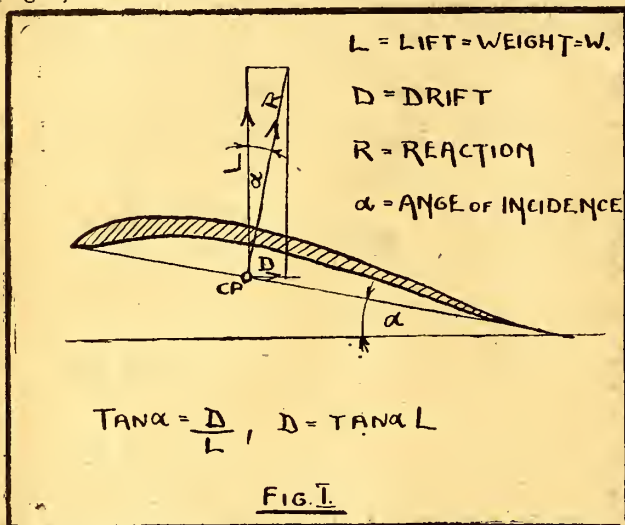
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HORSE-POWER CALCULATION FOR AEROPLANES.

[The following article by a designer of aeroplanes will doubtless be of interest to budding mathematicians in aircraft factories.—Ed.]

The thrust of the propeller depends on the power of the motor, and on the diameter and pitch of the propeller. If the required thrust to a certain machine is known, the calculation for the H.P. of the motor should be an easy matter.

The required thrust is the sum of three different "resistances." The first is the "drift" (dynamical head resistance of the aerofoils) i.e., $\tan \alpha \times \text{lift (L)}$, lift being equal to the total weight of machine (W) for horizontal flight and α equal to the angle of incidence. Certainly we must take the $\tan \alpha$ at the maximum Ky value for minimum speed, as then the drift is the greatest (Fig. I).



Another method for finding the drift is $D = K \times AV^2$, when we take the drift again so as to be greatest.

The second "resistance" is the total head resistance of the machine, at its maximum velocity. And the third is the thrust

for climbing. The H.P. for climbing can be found out in two different ways. I first propose to deal with the method, where we find out the actual H.P. wanted for a certain climbing speed to our machine, where

$$\text{H.P.} = \frac{\text{climbing speed/sec.} \times W}{550}$$

In this case we know already the H.P. for climbing and we can proceed with our calculation.

With the other method we shall find out the "thrust" in lbs. or kilogrammes wanted for climbing and add it to drift and total head resistance, and we shall have the total "thrust" of our machine and we shall denote it with T, while thrust for climbing shall be Tc.

The following calculation is at our service to find out this thrust for climbing $\frac{V_c \times W}{550} = \text{H.P.},$

$$\text{thence } V_c = \frac{\text{H.P.} \times 550}{W} \quad (1), \quad \text{H.P.} = \frac{T_c \times V}{550}, \text{ then from}$$

$$(1) \quad \frac{T_c \times V \times 550}{W} = \frac{T_c \times V}{W}, \text{ thence } T_c = \frac{V_c \times W}{V}$$

I consider this method to be more accurate than the previous one, as here the velocity of the machine is included, which is of course the minimum speed, to obtain the utmost surplus thrust for climbing.

Whether T means drift, head resistance and thrust for climbing, or drift and head resistance only, the following calculation is the same, only in the latter case, of course, we must add the H.P. required for climbing to the result to obtain the total H.P.

Now, when we know the total thrust, we shall find the H.P. in the following manner.

We know that the $\text{H.P.} = \frac{P_r 2 \pi R}{75 \times 60}$ in kigs. or in English measure

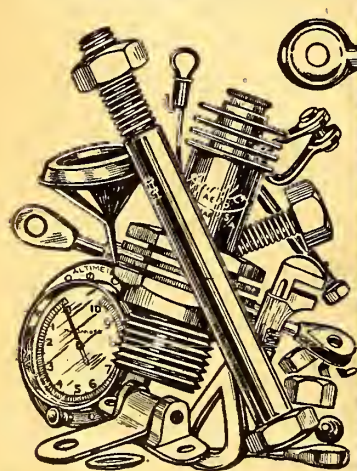
$$\text{H.P.} = \frac{P_r 2 \pi R}{33,000} \quad (\text{Fig. II.})$$

where P = pressure in kigs. or lbs.

r = radius on which P is acting.

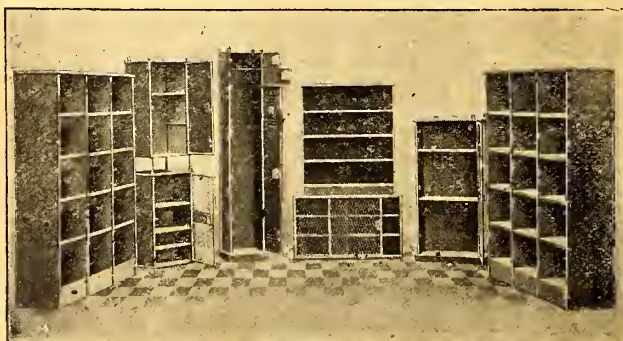
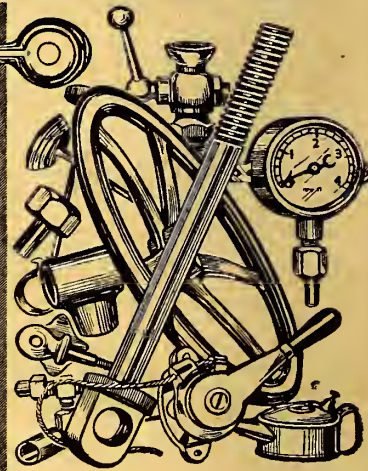
R = Revolution/min.

$$\text{When } P \times r = M, \text{ then } \text{H.P.} = \frac{M.R. 2 \pi}{4,500}, \text{ thence}$$



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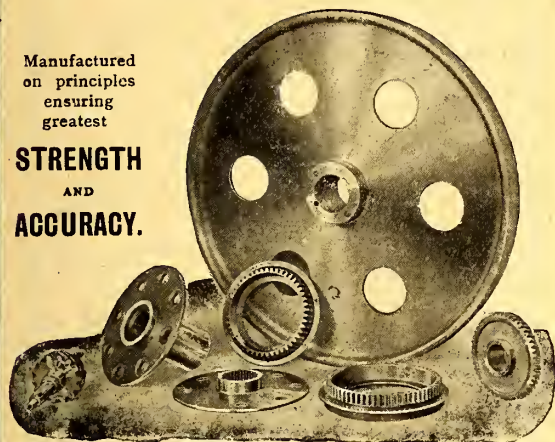
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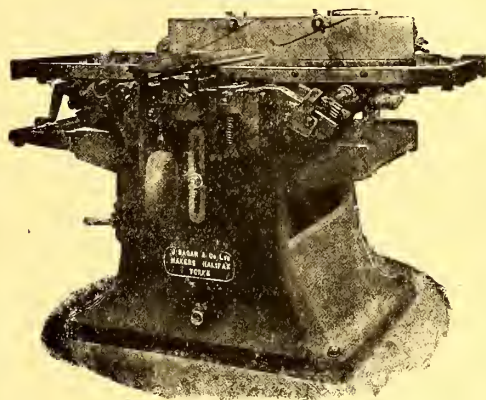
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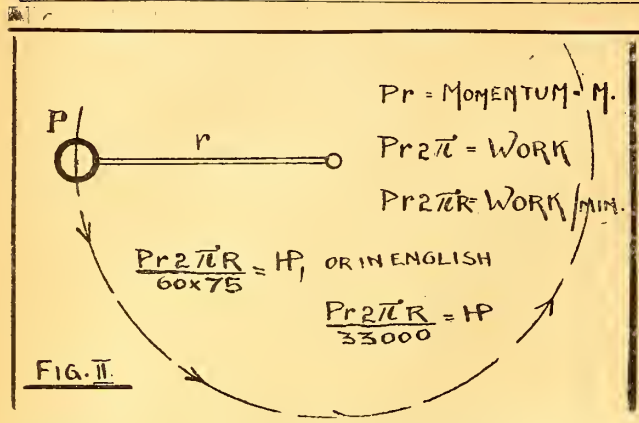
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$$M = \frac{\text{H.P.} \times 4,500}{R 2\pi} = \frac{716.2 \text{ H.P.}}{R} \text{ in metre kgs.,}$$

$$\text{or in English system } M = \frac{\text{H.P.} 33,000}{R 2\pi} = \frac{5253.1 \text{ H.P.}}{R} \text{ in ft./lbs.}$$

Now the power on the circumference of the propeller will be reduced by its radius so it will be $\frac{M}{r} = p$. A part of p will be used for counteracting the air and bearing friction, so that the total power on the circumference of the propeller will be $\frac{M}{r} \times \eta = p$ where η is the mechanical efficiency of the propeller. Now $\frac{p}{\tan \alpha} = T$. Where α is taken on the tip of the propeller.

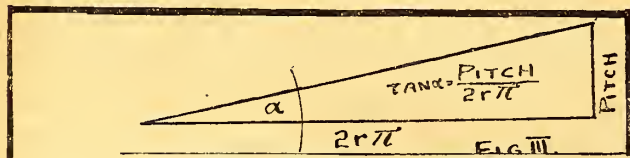
I take the α at the tip, but it can be taken, of course, at any point, but then in equation $p = \frac{M}{r}$, r must be taken only up to this point and not the whole radius, but it is more comfortable to take it at the tip as $\tan \alpha = \frac{\text{Pitch}}{r 2\pi}$ (Fig. III).

Now we can write up the equation of the thrust

$$T = \frac{716.2 \text{ H.P.} \cdot \eta}{R r \tan \alpha} \text{ or in English measure } \frac{5253.1 \text{ H.P.} \cdot \eta}{R r \tan \alpha}$$

$$\text{thence H.P.} = \frac{T \times R \times r \tan \alpha}{716.2 \eta} \text{ or in English measure}$$

$$\frac{T \times R \times r \tan \alpha}{5253.1 \eta}$$



In my own experience once, when checking the power, via thrust on a small 30 H.P. experimental machine, the spring balance showed 95 kgs. of thrust, and with the above calculation the thrust should be 94.5 kgs. Such correctness of the calculation is more of a coincidence than anything else, owing to the unreliability of the petrol motors, but always (and I had many trials) the spring balance showed a thrust of 95 to 105 kgs.

On another machine (50-H.P.) within my experience the spring balance showed 140 to 150 kgs. of thrust, while with the calculation it should be 134 kgs. I show the above two instances out of the many I could bring, to show that we are always on the safe side with this calculation, as we have always a few H.P. over and above our requirements at our highest speed and our highest climbing velocity.

There is another method of calculating the H.P. of motors, where we consider the mass of the air which passes through the blades of the propeller, and its velocity.

I propose to deal with this subject at some future date.—G. L.

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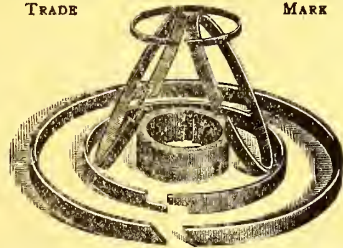
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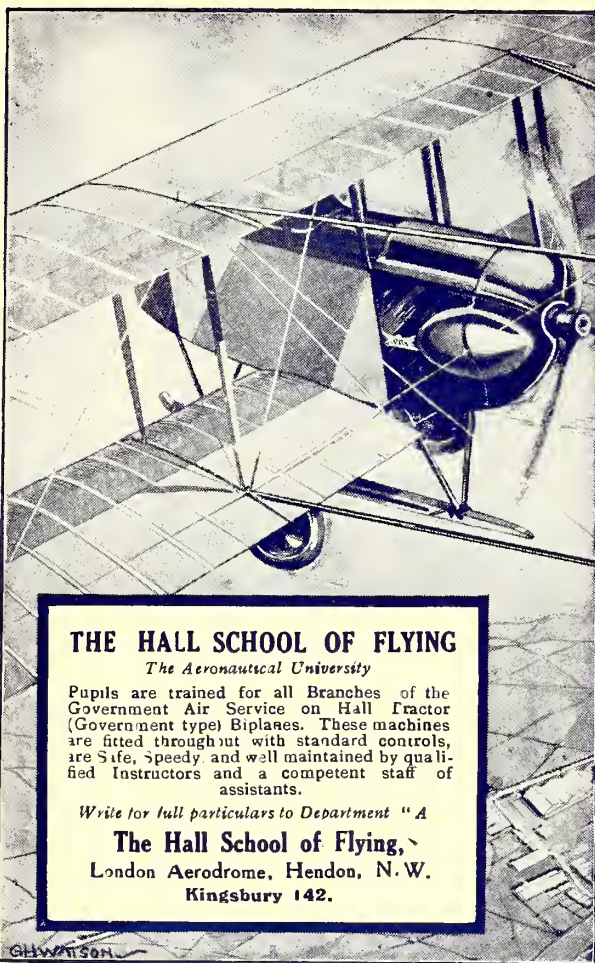
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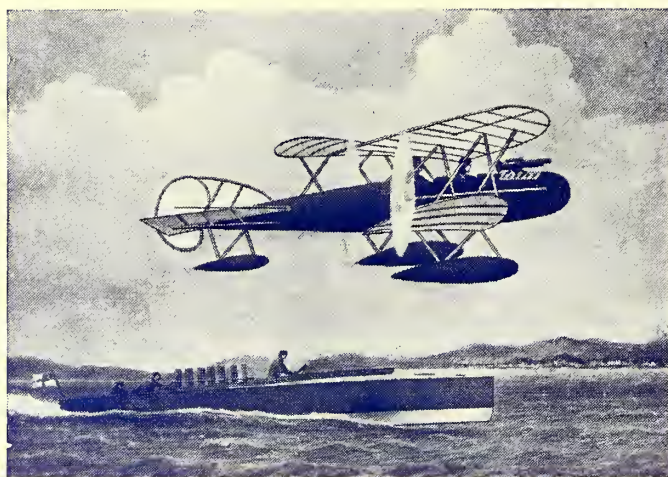
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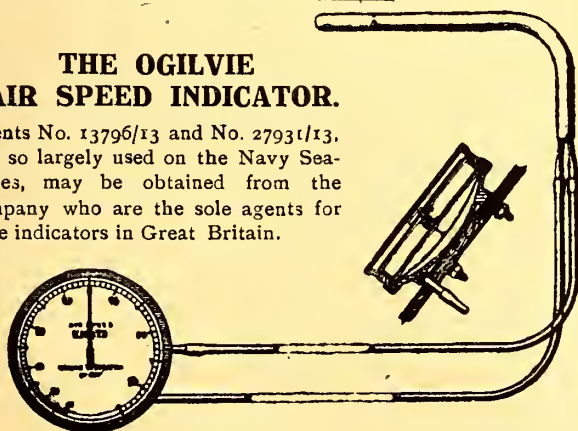
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ON THE LATEST INVASION.

Really the German is astonishingly English in some of his ways. It is true that he is more efficient and a better organiser, but he seems to suffer from the same wonderful lack of imagination. This likeness is not in any way surprising, seeing that both races are of the same Teutonic stock, and the difference is probably explained by the fact that for some nine hundred years Germany has been steadily fighting her way upwards in the scale of nations, surrounded by other peoples more numerous than herself, whereas the English, surrounded by water, have never had to organise against any really serious invasion since William of Normandy walked in and took possession in 1066.

Also, it is as well to remember that the Angles and Saxons and Jutes who overwhelmed the Romano-Celtic population between the years A.D. 300 and A.D. 600, or thereabouts, were the weaker Teuton tribes who were pushed over the edge of the European Continent by the stronger or better-organised tribes behind them. They only conquered Britain because the Romanised Celts had run to seed in centuries of peace, during which the only threat of invasion came from the North, where a few legions sufficed to keep the Picts and Scots safely on the other side of The Wall. In fact, the Britons under the Pax Romana, prior to the Saxon invasion, were very much in the position of the Britons of the 18th and 19th centuries, who never saw red war at close quarters, but always had little wars going on at a safe distance, which took a small proportion of the population away as soldiers, and gave the whole nation an excuse to pose as a warlike people.

The fat and well-fed citizen of Londinium probably regarded the continual scraps on Hadrian's Wall much as a City merchant of yesterday regarded our little wars in the Soudan or on the Indian Frontier. It was not till the Saxons came and burnt his warehouse that the Londonian realised properly that a war was going on, and much in the same way the Londoner is only now awaking to the realities of war.

Even the airship raids, though they caused inconvenience, probably caused a less number of deaths over a given period than occurred through street accidents caused by bad lighting of streets and vehicles. And because those raids took place at night, the Englishman refused to regard them as serious war, not having sufficient imagination to visualise their direct military effect in hanging up road and rail transport at night, and in closing down factories and delaying munition work next day. Now, however, that London proper has been bombed in broad daylight, perhaps the London shopkeeper will begin to realise that there is a serious chance of proper war being carried into the very heart of his sacred City.

So far, no airship has dropped bombs near the residences of "anybody who matters." After all, nobody

lives in the East End or in the Suburbs, except a few millions who keep the country going, just as in peacetime London is absolutely empty from July to November, for, although one still sees just as many people about the streets, they are not people who matter. I trust my readers will comprehend the difference.

Now, however, bombs have actually fallen where people who do matter congregate in sufficient numbers to cause some concern, at any rate to the shopkeepers, if any of them were explosively disintegrated. Therefore one has hopes that quite a number of people will begin to comprehend that London is now part of the war area.

The British Nation as a whole owes a deep debt of gratitude to the young gentlemen from Flanders who have so signally emphasised this obvious but uncomprehended platitude. One cannot, of course, tell the World at Large where the bombs fell, but the German General Staff will doubtless be glad to know that they missed the Houses of Parliament, No. 10, Downing Street, and the Admiralty.

Apart, however, from the good work done by this practical demonstration to the British Public, the Hun aviators deserve thanks for their kindly hint to the Air Defence Authorities that we may shortly expect similar daylight invasions on a large scale. Readers of this paper will recollect that something like a year ago it was pointed out that, if and when the airship menace was properly in hand, we might expect big aeroplane raids, which would be much more difficult to tackle. This may have been a single sporting effort, or it may have been a trial trip, but it is wiser to assume that it was the latter, and to act accordingly.

The really astonishing thing is, not that the raid happened, but that it has not been done on a much bigger scale, by fifty or a hundred aeroplanes, a dozen times during the past summer. This is precisely an example of where the Germans are so English. Instead of doing their tests at home and making their preparations quietly for a really big raid, they must go and "try it on the dog," so to speak. And only then months and months after the thing ought to have been done properly.

It is just about on a par with our habit of sending single experimental machines of a new type on active service, where they fall into the hands of the enemy, instead of having them fully tested at home by active-service pilots brought straight back from the front for the purpose. We did almost precisely the same thing with the first de Havilland fighter, which was shot down the first day it went over the enemy's lines. We repeated the performance with the first F.E. with the Rolls-Royce engine, only we made it worse by sending it out in charge of an inexperienced pilot, with a passenger who had never before been in an aeroplane,

so that they simply lost their way and flew into the enemy's territory. We acted almost as cleverly with the "Tanks" by sending out a few dozen to educate the enemy instead of sending a few thousand to break him. So it really is an immense consolation to find the enemy acting as kindly, or as foolishly—whichever way you like to put it. By all means let brotherly love continue.

At any rate, we have now had our warning of what to expect, so let us hope that the Home Defence Authorities in charge of aircraft affairs will act accordingly.

The airship menace may now be fairly considered a wash-out, thanks to improvement in armament and the adaptation of existing machines to a new purpose—though the said machines are far from being the last word in night-fliers. General Brancker and his staff deserve the thanks of the Nation for the way in which they have tackled the business. This seems to be peculiarly a fitting moment at which to pay a slight tribute to the excellent work done by Lieut.-Col. Higgins in experimenting with and arranging landing grounds for night flying and for improving the outfit of the machines used at night, and to Lieut.-Col. Holt for the general organisation of Home Defence against aircraft, which together account entirely for recent successes in hunting airships. It is now possible for a pilot at 10,000 feet or so, almost anywhere over England, to find landing ground if his engine stops, and, even if he cannot reach a prepared ground, he himself is able to illuminate the ground below him sufficiently to avoid a really bad smash. Thus pilots fly with far more confidence, and naturally achieve better results.

One is glad to see that R.N.A.S. pilots in Norfolk have had a chance of proving their worth, albeit on a winged bird. It is, at any rate, some compensation for the hard luck of an R.N.A.S. officer who not long ago chased a Zeppelin far out to sea, and hit it successfully several times with some wonderful patent projectiles so designed that they only become active after a greater

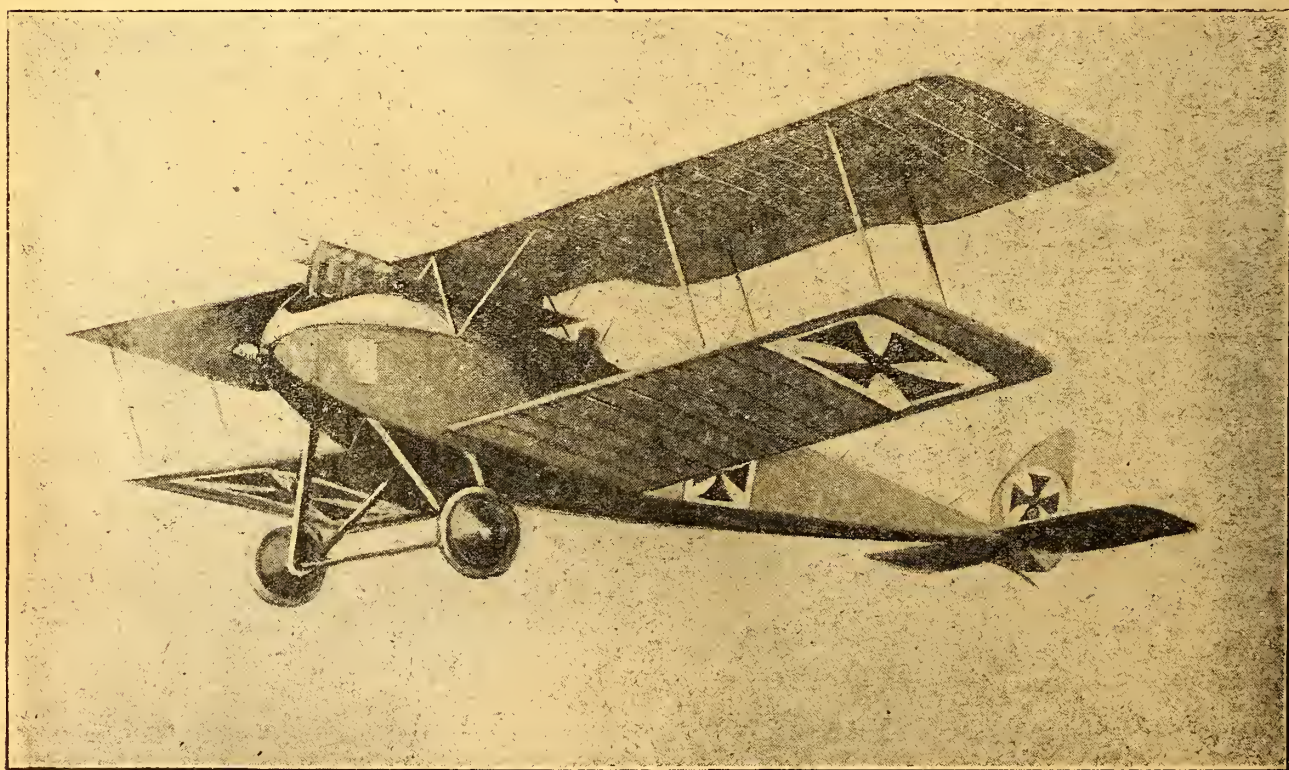
distance than that from which he attacked the airship, and so did her no harm. Thanks to official fatuity and bad organisation, the very gallant youths who are merely flying officers in the R.N.A.S. have had very little chance of doing useful work, despite all the risks they run and the hard work they do, and one hopes that this success may encourage them to keep keen until the R.N.A.S. is reorganised, as it is bound to be before long.

It is well, however, not to assume too lightly that we have done with Zeppelins. It is very unlikely that any more small raids by a few ships at a time will be made on any part of the country, now that the Germans have found that the Provinces are as well guarded as London itself. But it is quite possible that at some political, or especially a dynastic, crisis a huge raid by fifty or more ships may be launched, in full knowledge that half of them will be lost, merely for the sake of distracting the attention of the German people from events nearer home.

Nevertheless, the real aerial danger of the future is from aeroplanes. We know that German aeroplanes can fly at night as well as our own, so that we are quite likely to have aeroplane raids at night as well as in daylight.

Against aeroplanes at night, anti-aircraft guns and searchlights can be of practically no use, except that the lights might dazzle and confuse the pilots. In our misty air an aeroplane at 10,000 is unrecognisable, and at 15,000 invisible even in broad daylight. The new German machines fly habitually between those heights, so we may give up any idea of hurting them from the ground. The only defence is a regular system of aeroplane patrols, complete with guns, searchlights, and wireless of their own.

Such machines were advocated by Mr. Pemberton-Billing in January of this year. Before he completely severed his connection with the Aircraft Industry, on entering Parliament, he actually built a machine for the purpose. This machine was, and is, the most promising



The New Halberstadt Biplane.—Drawn from a rough print in a German paper.

thing of her kind yet designed, so far as general lay-out is concerned, and only a marvellous combination of Service fatuity, personal jealousy, technical ignorance, and political intrigue in official circles has prevented her from being developed by about June last into the finest long-range night-patrol machine in the world.

Even now, if General Brancker and his staff take the design out of Admiralty hands, it can be evolved into just what they will need in a few mouths' time, if not sooner. Mr. Pemberton-Billing has nothing to do with the Trade now, so that the technical people at Adastral House need have no fear of putting either cash or kudos to the credit of a politician. And if Adastral House does not care to touch such tainted material, any mere trade firm can take over the general scheme and improve upon, without saying "By your leave" or "Thank you" to anybody. There is the type of machine, any way, and it is no further advanced now than it was nearly a year ago. Which seems rather a pity, seeing that we shall probably need it in quantities in a few weeks' time.

In any case, when the aeroplane raids start, and prove more damaging than the airship raids, at any rate where London is concerned, the Authorities cannot say that they have not had a fair warning of what to expect.

These raids are not likely to reach the big industrial centres for some time to come, as aeroplanes would have to fly for ten or twelve hours at a stretch to get there and back, which would mean that they could scarcely carry enough bombs to make the risk worth while. Such aeroplanes will probably be developed after a while, and may be in use during the last two or three years of the war, but sufficient unto the day is the evil thereof, and it will suffice if, in the next two or three months, we prepare an adequate reception for invaders of last week's type.

Finally let it be said that the Flying Services think very highly of the sportsmen who manned the raiding machine. They are regarded as no ordinary fellows. Either Service would have been pleased to have had the opportunity of congratulating them personally, and of signifying the same in the usual manner.

The general opinion seemed to be that this lone hand raid was quite the funniest thing that has happened in the war. The sheer cheek of it tickled our flying people to death, and the usual reception of the news was the exclamation, "Well, I'm damned!" followed by a roar of laughter. But future raiders may not have such a friendly reception.

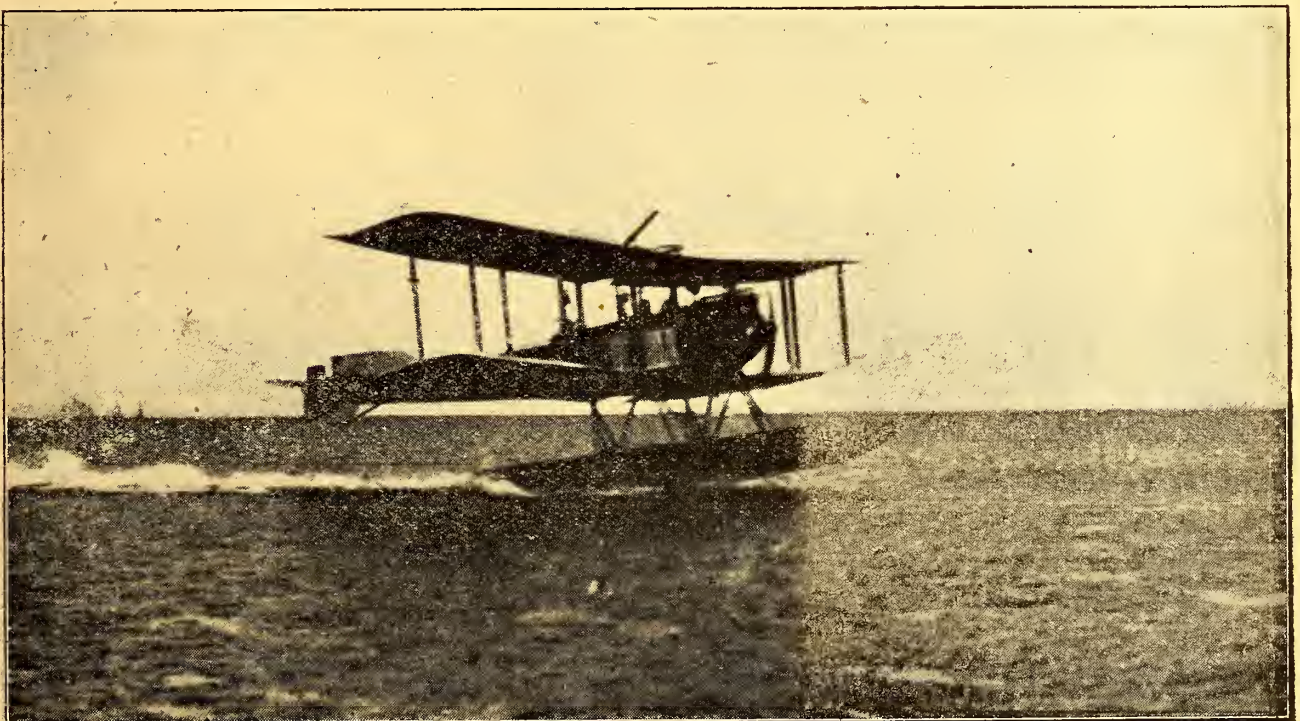
C. G. G.

ON MAN POWER.

Probably about half the evils in this country arise from misreading the Twelve Commandments and the Church Catechism. One of the most harmfully misread passages is that which enjoins us to do our duty in that state of life unto which it has pleased God to call us. The average man—especially the one at the top—interprets this as meaning that, wherever one is put by those in authority there one is to stop without murmuring. He never reckons that, in struggling to get out of the job into which one has been put by the ordinary addle-pated official, one may be obeying a higher call to a higher place.

The ordinary official certainly has not been called to his position by any Divine favour, so he has no prescriptive right to suppose that Divine powers have been

delegated to him, but that is the usual official attitude, and the smaller the official the more certain he seems of his powers. No G.O.G.-in-C. is half as impressive as a drill-sergeant, and no Council of Empire could ever be so pompous as the average Bench of Magistrates. Hence the hopeless lack of efficiency in all our doings, due to the fact that the right man is never put in the right place. I claim some credit for having made the great discovery that, if one ever finds a man in an official position for which he is eminently fitted, one may lay any money that he was given that position on account of some quite unnecessary quality which he fortunately does not possess. And, thanks to the fallibility of official judgment, mistakes of this kind happen in a very high percentage of the appointments made. Which



A Gotha Seaplane, belonging to the Turkish Navy, getting off the water.

is why we shall ultimately win the war, or at any rate avoid losing it.

Much has been written and spoken about Man Power of late, from which one gathers that the Man Power Board is supposed to be concerned with producing the maximum efficiency from the man-power of the Nation, with the ultimate object of winning the war conclusively. It is believable that, if our man-power were efficiently organised, we could carry on the war indefinitely and make a profit out of it, by the simple process of keeping Germany cut off from the world's trade, while we and our Allies produced enough merchandise and war material to fight and trade at the same time.

It is evident, however, that, so long as we continue to waste man-hours and material as we have been doing in the past, it must take us all our time to keep our portion of the war going satisfactorily. And this is as it is because the right men are not more often in the right place.

Quite early in the war Field-Marshal Sir Evelyn Wood, in a speech intended to be highly patriotic, delivered himself of the misguided phrase, "Does my country need me to sweep a crossing? Give me the broom!" There you have the key to all inefficiency. A soldier sweeping a crossing might well be adopted as the emblem of officialdom, together with its companion picture of the crossing-sweeper failing to be a soldier.

It is probable that in all things concerned with aircraft there is no more inefficiency than in other walks of life, but, as this paper is devoted to aeronautical affairs, it seems well to tell of some few instances, taken at random, of needless waste of good human material, so that those who control such matters may see what to avoid.

Of course, the first instance that will occur to everyone is the appalling waste of good men in the R.N.A.S. Here we have hundreds of highly skilled and very brave pilots, frequently under exceedingly able commanding officers, formed into excellently organised and trained squadrons, and yet without any visible effect on the war.

Questions in the House of Commons have suggested quite clearly that some of these squadrons in Flanders have actually been prevented, for some inexplicable official reason, from doing work of high military—or rather naval—value. It is obvious that these squadrons could at least have prevented Zeebrugge, or any other Belgian harbour, from being used as a destroyer or submarine base, if adequately equipped with bombs or guns capable of damaging such light seacraft. And it is common knowledge that the R.N.A.S. actually possesses both bombs and aeroplane-guns of sufficient power. Also, it is known that the one ambition of senior and junior officers alike has been to do just this work, and that there are machines in quantity and quality to enable them to do it.

If this task had been set these squadrons, there seems little doubt that the work would have been done, and there would probably have been no destroyer raids in the Channel and on the South-East Coast. The right men are there, on the Continental side of the Channel at any rate, but their man-power must have been wasted. It is to be hoped that the House of Commons will insist on knowing whether this is so or not. Is it that these squadrons have not the necessary machines and armament, or is it that they are not allowed to use them? And, if not, who is to blame? Is it the people at the Admiralty, or those in between the Admiralty and the squadrons? The waste seems evident enough. It should be explained, both as a right to the nation which pays those who are at fault for the work they seem not to perform, and in common justice to officers and men who want to do the work which, seemingly, they are not allowed to perform.

SPECIFIC INSTANCES.

The R.N.A.S. has among its ratings, and the R.F.C. has among its rank and file, numbers of highly skilled men from various trades, but it is by no means certain that they are all efficiently employed. There must naturally be a great deal of time wasted at air stations, because the workshop staffs must be big enough to deal promptly with repair jobs, and it may happen that, owing to good luck or bad weather, there may be no breakages for a period, and in that period the men must be short of work.

Nevertheless, there is much difference between one station and another, according to the nature of the C.O. In one station, for instance, slightly damaged propellers are rebuilt and made as good as new during slack times in other repairs, while at another station any propeller which is damaged in the least degree is scrapped altogether, thus wasting valuable material and leaving the men idle.

It seems reasonable that every station should be supplied with a certain amount of raw material to be worked up into spare parts during slack periods. But what is even more important is that men should be employed on jobs for which they are suited, and this is where all our Services fail worst.

In one instance, according to my information, an experienced engineering draughtsman joined the R.N.A.S. as an air mechanic. A certain station heard of him through one of its engineering staff, and, being in need of a draughtsman, applied to have him sent to that station. The department dealing with personnel, instead of sending him there, promptly drafted him off for a handling-party for balloons. This hardly seems the best way of using man-power.

In another instance, one of the linotype operators in the firm which prints this paper, having to join the Army, applied for a job as air mechanic R.F.C. Now, the man who can run a linotype machine is no fool as a mechanic in any case, but this particular man happens to be an unusually smart amateur mechanic. Not only did he do ordinary running repairs to his lino., but he made all kinds of things in his spare time, including a grandfather's clock, case, works, and all. He went to one of the R.F.C. examining depots, and just because he could not say that he had served his time to a recognised mechanical trade, the people in charge refused to look at him. Like a wise man, he went off to an A.S.C. depot, where they gave him a fair trial, and promptly put him on the repair staff. Then, apparently being short of drivers, they put him on to drive a motor lorry.

Being what he is, he will probably make a very good lorry driver, and will be particularly smart at doing roadside repairs. But the R.F.C. has lost a priceless all-round mechanic, for he was equally handy with either woodwork or metals. Personally I think he would be serving his country still better in an aeroplane factory as a producer, for he is a genuine worker, and keen on making things that are useful. However, there you have an example of sticking to rules unintelligently. Better a bad plumber who has served his time than a first-class amateur mechanic.

Yet some men manage to squeeze in without qualifications. I heard not very long ago of an aeroplane engine which was in charge of an alleged mechanic who a month or so earlier was a tailor in London. There is unfortunately no documentary evidence to support the story, but I am told that the officer who flew the machine has since "failed to return"—to quote the official phrase. It should be worth the while of someone in the R.F.C. to investigate this instance further, and, if it be substantiated, to find out how that man managed to join

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the Corps. The efficiency of R.F.C. mechanics affects the man-power question in more ways than one.

Apparently the R.N.A.S. goes to the other extreme, and is apt to accept its mechanics at their own valuation. One pilot of my acquaintance was discussing this question recently, and instanced one of his own mechanics, who, after doing some astonishing piece of work, alleged that he had been a "fitter" before joining up. Investigation proved that it was a tailor's fitter he had been. Another officer recalled that one of his men claimed to have been a riveter, and turned out to have been employed in putting brass rivets into harness. Yet another mechanic was taken in on the strength of being a sheet metal worker, and was found afterwards to have been employed in working a semi-automatic machine which punched the tops of tobacco tins out of tin sheet.

OPERATIONS.

Somehow the ingenious twists given to these designations by the men reminds one of a rather delightful story which is going the rounds in the Admiralty. A certain fond mother has a son who wished, as she desired he should, to join the R.N.A.S. The lady thereupon wrote to Their Lordships, expressing her longing to enter her son in this gallant Service, stating that the boy was threatened slightly with varicose veins, and asking did Their Lordships think that, if the defective blood-vessels were removed, the lad would be passed as medically fit? It is alleged that the wag into whose hands the letter fell promptly sent it along to the Operations Department.

Unhappily, the Admiralty is not always either humorous or prompt in dealing with applications. For instance, many months ago a certain officer who was about to take a squadron abroad asked me whether I could recommend him a Stores Officer—an R.N.V.R. job, corresponding to Equipment Officer R.F.C.. It so happened that I could, and did. The man I recommended knew as much as need be about aeroplane parts; he had had a fine business training in the aircraft industry; he was clever and hard-working, and just the man for the job. The C.O. met him by arrangement, approved of him, and gave him a note to send in with his own application. The application duly went in. After three or four weeks the applicant inquired at the Admiralty what was happening, and was told that his application was going through, and his prospective C.O. wrote again to try and help hurry things along.

This performance was repeated at least three times at intervals of a fortnight or three weeks, but no definite reply was received. Finally, the squadron went abroad with another Stores Officer, and my young friend, being bored, applied for an Assistant Equipment Officer's job in the R.F.C.

A week or so later he was ordered to Farnborough on probation, and after a fortnight's trial was told that he might as well go up to town and buy his kit, as he would be appointed in another week or ten days. While he was in town shopping a note came from the Admiralty telling him to appear before the Selection Committee on a given date. Saying nothing about the R.F.C., he appeared and was duly inspected and questioned, and was told that he would hear the decision in a few days.

Then he went back to Farnborough, finished his course, was duly appointed A.E.O. to an active-service squadron, and started work. Some weeks after he had been with his squadron, and incidentally had won the high opinion of his C.O., he received a polite note from the Admiralty saying that his services would not be required. So the R.N.A.S. lost a very efficient Stores Officer through sheer bad management and judgment, after keeping him hanging about for over three months, and the R.F.C. profited thereby.

The other side of the affair is even funnier. Another friend of mine, during this same period, thought he would like to join the R.N.A.S. as Stores Officer. He knew absolutely nothing about aeroplanes, but he did know the wife of an officer of high rank, entirely unconnected with the R.N.A.S.

From her he received an introduction to her husband, who without further trouble introduced him to a senior officer R.N.A.S., who promptly put his application through, presumably with some necessary mystic signs thereon, and in less than three weeks from the day when he asked the lady for the introduction he was on duty at his first station.

It so happens that he is an exceptionally able man, and, instead of being one of the many useless people in the R.N.A.S., he is, in fact, being wasted on a trivial job which he could do in his spare time between tea and dinner. But it would have been all the same if he had been as incapable as some of the others, which sweeping statement is rather borne out by the fact that no one took the trouble to find out what his capabilities really are. Hence his being wasted on a purely futile job, which, however efficiently it may be done, is simply throwing away public money.

If anyone in authority at the Admiralty would like to know why, I shall be happy to tell him, and to supply other examples of the Air Department's genius for wasting man-power.

GOOD MEN WITHOUT WORK.

It would be funny, if it were not so tragic, to read of all this outcry for man-power when one knows so many instances of pure waste of good men, or of refusal to use good men when they apply for jobs. Soon after the beginning of the war, a life-long friend of mine, a Colonial administrator of many years' experience, with a fine record, a barrister by profession, and a captain of Militia to boot, came home on sick leave. By a marvellous piece of bungling by official doctors, he had to have a leg amputated. On recovering from the operation, and after being refitted, he applied for official work. He is a few years over forty, a very able man mentally, and as active as need be for office or inspection work. Yet no one wanted him.

After much hunting about, he found work in a very subordinate position in an aircraft factory. Ordinarily the job would have been filled by a 30s a-week clerk, but he took it rather than do nothing. His ability soon showed up, and he was appointed to look after the general discipline of the factory, which employed a number of invalided soldiers, whom his military training enabled him to handle very successfully. Finally he fell foul of a junior Government inspector on a point of discipline—a matter of which he had had more years' experience than the inspector had had months in uniform. The inspector, instead of making an official affair of the argument—in which case he would have got the worst of it—used personal pressure on the firm, which allowed itself to be intimidated into dismissing this very useful employee.

And now once more a man who has run successfully a piece of the map about the size of Wales is doing a clerk's job, whereas with his administrative, legal, military, and manufacturing experience he is precisely the man who ought to be combing out the "trench dodgers" who pose as skilled workmen on the strength of a few months spent in a factory. After which he is quite capable of taking the place of one of the "Class A" men in Whitehall. And then we argue about man-power.

OTHER PEOPLE'S EXPERIENCES.

After that, for a change, it may be well to give the experiences of a few other people in the matter of wrong men in the wrong place. Here is a beautiful example from the Royal Aircraft Factory, though let me hasten

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to add that it occurred in the pre-reform days, before a real engineer took control. The subject of the story was chief of a department, and the story is best told in my correspondent's own words:—

"On one occasion this person visited the foreman tinsmith and requested that he should send up two men to 'tin' some plates which he would show to them.

"The foreman asked for them to be sent down to his department, owing to having to heat them a little before doing this operation. 'You will not warp them?' was my chief's reply. Upon this the tinsmith came into our departmental workshop to see the plates referred to; and was amazed, naturally, when two cast-iron marking-off tables and some cast-iron surface-plates were shown to him.

"I will not attempt to put on paper or even translate the language spoken to our chief by the tinsmith. Our chief was rather dismayed, for he fully thought that it was a capital idea of his to prevent these articles going rusty.

"I am afraid that, if his idea had been left to him to carry out, all lathe slides and surfaces would have been treated in this way."

Now, there is a delightful person to have in a responsible position. One assumes that he has lost his job by now, but what can one think of the officials who gave him the job to begin with? And why should such a man have such a job when so many really experienced men are looking for promotion to positions in control of the masses of unskilled labour now being imported into munition work?

A DESIGNER'S COMPLAINT.

In quite another direction, here is a complaint from an aeroplane designer, agreeing with the suggestion made recently that not enough is done to spread information on technical matters among the younger generation of draughtsmen and designers. He says:—

"As an aeroplane draughtsman, several points have come to my notice on which we might reasonably look for assistance from the R.A.F. and N.P.L., etc.

"1st. Wing sections, which they have facilities for testing, and we have not. There should be special sections suitable to the highest speeds up to 150 m.p.h., also for medium speeds with heavy loads. School machines with low starting speed would require another.

"2nd. A standard list of propellers, with diameter, pitch, and h.p. at given miles per hour, would save us money and time.

"3rd. The h.p. of various engines may be obtained on the test bench, but we want to know how much of it we shall obtain in practice.

"4th. Accurate data are required as to what existing machines can attain in m.p.h. and climb.

"Unless this class of information is supplied freely to all controlled firms, many months are wasted, and how can we expect to beat the Germans?"

It must be obvious that, unless such information as that indicated, and a good deal more besides, is circulated freely among designers—especially among those who have had previous engineering training, but are new to aeroplane work—it is impossible to get the greatest efficiency out of design departments. I trust that some of those in authority at Blackfriars and Whitehall will give this point due, but not too lengthy, consideration, and act accordingly within the next year or so.

A DRAUGHTSMAN'S VIEW.

Another letter of interest is from a man who seems to have had fairly intimate acquaintance with both official and unofficial drawing-offices. He writes:—

"Your article in THE AEROPLANE, called 'On a Few

Practical Points and Suggestions,' calls for comments in the part referring to draughtsmen.

"You state 'draughtsmen are particularly notable for their sublime ignorance of workshop practice.' This may be so with a few, but the majority are men who have served their time in a works, and design things which they can make if called upon to do so.

"Aeroplane design is carried on very differently from engineering design. In the latter, details are got out and arrangements are made to see if everything fits together before the drawings are sent into the shops; but with the former some drawings are made, and the foremen make some parts, which the drawings are made to; result, parts do not fit together. Aeroplanes, as at present constructed, are not strictly an engineer's job (except the engine), but merely high-class carpentry and tinsmith's work; no doubt, in the future, when machines will be built of steel throughout, the work will be treated more seriously as an engineering problem.

"Draughtsmen in the R.N.A.S., judging from those I have come in contact with, have to draw out what they are told to, from instructions from their superior officers, consequently any mistakes, which occur are not due to the draughtsman, but due to the officer that instructs him. A man is not encouraged to use his abilities or initiative.

"Draughtsmen in private firms are always blamed for any mistakes which arise. These mistakes sometimes occur through the drawings not being worked to, but, as some person or persons must take the blame, it is usually the drawing-office that gets it; 'a blame-taking department' it could well be called.

"Your remarks about a draughtsman being 'a bad workman who prefers a black coat to a khaki one' is very unjust, as some of the very much despised draughtsmen wear khaki coats at their work.

"Your suggestion of lectures for our despised class to attend is very good, and there are plenty who no doubt would be only too pleased to go to them, were they existing."

This correspondent signs himself "15 Years Engineering Designer and Draughtsman," and, no doubt, if we had more draughtsmen of his class, we should have fewer drawing-office mistakes, and less consequent waste of man-power and material.

AN ANECDOTE OF A PRACTICAL MAN.

All the same, one cannot help recalling the old story of Stonewall Jackson in the American Civil War. General Jackson was reputed to be the first G.O.C. to carry about a technical staff of trained theoretical engineers. On one occasion the army wanted to cross the Susquehanna, or Potomac, or some other comic American river, and Jackson sent for his engineering draughtsmen and instructed them to prepare plans for a suitable bridge. He also sent for his chief sapper officer—one of the good old rule-of-thumb school—and told him to collect the material for the bridge. At the end of two days the old sapper strolled in and remarked, "Say, General, that bridge you wanted is ready, and I guess the army can get right along! But we're still waitin' for them pictures!" Even in aeroplane-making one sometimes has to wait an unholy time for "them pictures," and occasionally the pictures are not as accurate as they might be.

A.I.D.

On occasion I have referred to the need for A.I.D. reform. Lately I have had several complaints about material being held up owing to slackness on the part of A.I.D. inspectors.

The R.F.C. needs, say, spare parts. The firm making the spares perhaps orders machined fittings from another firm, and that firm orders its raw material from another

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firm, or, at any rate, the castings or stampings. These castings or stampings have to be examined by the A.I.D. Then the machined stuff has to be examined by another lot of A.I.D. people at another shop. And then the completed parts have to be examined by another A.I.D. batch.

Obviously, if the inspector of the raw material is at all slack, he delays all the other shops, and decreases the amount of material the other A.I.D. people have to inspect, which distinctly tends to make them lazy. I commend to the chiefs of the A.I.D. a general speeding up of their subordinate officials, and a general reduction in their numbers, with, at the same time, a considerable increase in their quality and pay.

It is by no means rare to have complaints that A.I.D. examiners and viewers know nothing of their jobs, and yet it does not seem too easy for an experienced man to get a job in that department. Here is a letter as an example:—

"I was rather amused at your articles *re* A.I.D. inspectors, and, knowing it to be true, and also failing to see where their abilities stood out, I thought I would have a try, but to no purpose.

They sent me a form to fill in, and the questions—well, all that seemed to me to matter was whether I was English or a Laplander—nothing bearing on what I was expected to know! Oh, yes, there was 'Profession.'!

"Well, I told them I had served an apprenticeship in a Government dockyard, had also been in private shipyards on both wood and steel, had been foreman on house work, had a good sound knowledge of all kinds of timber, had a practical experience of building

and moulding and tracking propellers, and yet I get a paper back to say my application was unsuccessful.

"I suppose if my birthday had been in 1896 instead of 1866, I might have stood a chance. Even then I should have known the names of the different timbers used, and not have to be tutored into the mysterious ideas of the strength and durability of what they are trying to inspect."

There does not seem to be any insurmountable objection to employing a man of 50 as a viewer or examiner if he knows his work. Anyhow, it seems a pity to have turned him down without even finding out whether he knew what he claimed to know.

Apropos the A.I.D., a mechanic writes that he happened to ask a feminine friend the other day what line of business her husband was in. She replied very indignantly, "Oh, my husband doesn't work! He is an A.I.D. man." The writer adds, "This is my idea of describing the A.I.D." Rather cruel, is it not? But near enough to the mark in a good many cases.

STANDARDISATION.

Quite a great deal of man-power at present wasted in the A.I.D., and in all factories for that matter, can be saved by a proper system of standardisation of aircraft parts, and by reducing the number of sizes of fittings. The subject, however, is too big to be dealt with in this article, so I will leave it to other hands.

Meantime I trust that the specific instances quoted hereinbefore may indicate to some of the people in authority the foolish way in which we are wasting our productive man-power at home, and so depleting our destructive man-power abroad.

C. G. G.

THE NEW FIRST SEA-LORD.

Those concerned with sea-flying will feel greatly cheered by the appointment of Admiral Jellicoe to the position of First Sea-Lord of the Admiralty. Sir John Jellicoe has taken considerably more than a passive interest in aeronautical affairs ever since he took command of the Grand Fleet. In the very earliest days of the war he personally investigated the possibilities of both land and seaplanes, when naval pilots on shoregoing machines were gallantly flying over the coasts of the Scottish Islands on the lookout for enemy submarines, and since then, he has kept closely in touch with the work of such seaplane-carriers as were with his fleet.

However makeshift a job those carriers may be, the gallant and capable officers aboard them may comfort themselves, after all their neglect and discouragement from the Admiralty, with the thought that they have done something to instruct the new head of the Navy in the uses and abuses of seaplanes, and one only hopes that they have had full opportunities of impressing on him the limitations under which they have had to work, as regards aeroplanes, engines, ships, and accessories.

At any rate, one knows that Sir John Jellicoe entirely sympathises with the uses and users of aircraft, and it is even rumoured that he once went so far as to express approval of a new type overcoat,—not a blue British warm,—designed and worn by an R.N.A.S. officer for warmth, comfort, and elegance. Also, he is not suspected of having any conscientious objections to retaliatory frightfulness by aircraft or any other weapon.

One hopes, therefore, that his appointment heralds the advent of a very much happier period in the history of the R.N.A.S. than that covered by his predecessor.

THE R.N.A.S. COMFORTS FUND.

The recent appeals in *THE AEROPLANE* and elsewhere for contributions to the R.N.A.S. Comforts Fund have had a very gratifying response, but the enormous size of the R.N.A.S. at the present time makes it necessary to spend still more money.

Contributions in kind as well as in cash will be gladly received. They should be sent to Mrs. Sueter, The Howe, Watlington, Oxon.

The following amounts are acknowledged this week:—

Mrs. Mackworth collected £281 6s.; on account of royalties on sales of "In the R.N.A.S.," £50; Mrs. Samson, £18 3s.; Mr. and Mrs. C. Kilburn, £2 2s.; Miss A. Bolton, £2; Hoyt Metal Co., £2; Miss Biddlecombe, £1; Miss K. Barton, 10s.; Master Garth Forsyth, 1s. Total to date, £2,471 13s. 8d..

It must be clearly understood that this sum is not kept as capital, but is spent on various forms of comforts as soon as it is received, which makes it the more necessary that donations should come in regularly.

TO REMOVE MISAPPREHENSION.

It has been pointed out to me that a certain reference in a recent issue of this paper to the drawings of the "Scarff Ring," as officially furnished, might conceivably be taken as casting aspersions on the said ring, and, consequently, on its designer, Mr. F. W. Scarff, Artificer Engineer, R.N., so I take this the first opportunity of removing any misapprehension which may possibly exist on this score. Unfortunately, owing to there being a war of some importance in progress, it is impossible to describe the said ring for the benefit of the uninitiated, or even to indicate what the ring is for, or why Mr. Scarff invented it, but Service readers will know to what I refer. Let me, therefore, state that even before I knew who had designed it, I was filled with admiration of its simplicity in operation, its neatness, and the general excellence of its design. On being told who was responsible for it, I was even more interested in it, for I have known Mr. Scarff and his work practically ever since the Navy began to be concerned with flying.

As a Warrant Officer he won for himself golden opinions at Eastchurch, both for his mechanical cleverness, and for his ability and thoroughness in handling engineering material. His subsequent appointment to charge of stores at Calshot was made on account of these qualities, and the post carried with it the unofficial job of Chief Engineer of that station. His then Commanding Officer, I know, regarded him as the most reliable authority extant on all the troubles which beset aeroplane engines, and aeroplanes also. And, be it said, his diagnosis of a trouble was seldom in dispute, while the improvements and additions to existing mechanical appliances, for which he was responsible, were numerous and valuable.

Since war broke out I have heard at frequent intervals of more good work to his credit, so I should scarcely write anything which appeared to me to reflect in any way on one whom I know to be a highly efficient practical engineer. If Mr. Scarff himself read those lines as referring to his own work I trust he will accept my sincere regrets that he should have done so, and if a false interpretation has been put upon them by someone else bent on making mischief, I trust that he will treat such person or persons as mischief-makers deserve to be treated.

I take it that Mr. Scarff does not personally produce all the drawings of his designs which are sent out to contractors by both the Flying Services, and it is evident that my informants, who were puzzled by the drawings officially supplied, cannot have had drawings which had been passed personally by him.

Finally, I trust that I may be permitted to congratulate Mr. Scarff on having produced one of the most ingenious and most useful inventions of the war.—C. G. G.

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The Air Services and the Present Crisis—(Continued).

BY "BERKELEY."

Under the suggested strengthening of the aeronautical arms of the two Services made in the first part of this article, airships would remain for the present and possibly for the future a section of the Royal Naval Air Service. The use of the airship in the immediate future will, it would seem, be confined to naval reconnaissance over the sea. The recent casualties to the Zeppelin fleet during raids over Great Britain indicate in a manner the complete submission of the airship to the aeroplane even during the protective gloom of night. But for long range strategic reconnaissance over the sea at a sufficient distance from enemy territory to render unlikely the interference of aeroplanes the airship is still a weapon of high efficiency.

Further developments in the science of aeronautics may add to the sphere of influence of the dirigible balloon and give it a degree of superiority over the aeroplane in a similar sphere of action. Non-inflammable gas of high buoyancy, for instance, if used in Zeppelins, would add seriously to the troubles of those who fly by night in a feverish search for the honour of a decoration or the solace of eternal rest within the gentle shades of Westminster Abbey. The discovery of such a gas is, if the views of the experts possess value, not unlikely to be made in the near future.

If the construction and the use of airships remain a duty of the Royal Naval Air Service then it would be only natural for those soldiers who have for some years past been seconded from their regiments for duty with the Royal Naval Air Service to be transferred permanently to that body. Regimental life has probably by now lost all the charm it once possessed and their new sympathies may have drifted to the Navy.

Kite-balloons, which have by now proved of high value, will of necessity be used by both Services. The Army would possess a greater number than the Navy owing to the wider possibilities of use, but that is a matter of detail to be decided when the general principle has been admitted. In any case kite balloons involve neither such difficulties of design nor supply as do aeroplanes. The training of personnel is simpler and less expensive.

Even within the Ministry of Munitions, if that department becomes responsible for the supply of matériel to the Flying Services, there is unlikely to be much overlapping in the indents of the Army and Navy. There has been up to the present too much tendency when designing a seaplane to produce an ordinary aeroplane first and then add floats to it.

Occasionally this habit of mind has led to unsuccessful seaplanes brought together in this manner being converted by an alteration of chassis to a semi-efficient land-going aeroplane. In truth the methods of design and construction should bear little similarity in these two classes of aircraft. The Navy under the suggested scheme would be able to devote almost exclusive attention in so far as aerial matters are concerned to the production of a successful series of seaplanes.

Types of engines will probably continue to be similar in the two Services save that the Navy is less likely to require air-cooled

motors if it concentrates on seaplanes. The reasons are sufficiently obvious not to need recapitulation.

The Ministry would prevent either Service from obtaining an exclusive contract with any engine-building firm. Urgency would decide the issue and not an over zealous capacity for the trans-action of petty business as in past days.

With this transfer of aircraft supply to the Ministry of Munitions it will be necessary to so arrange the organisation that on the abolition of the Ministry after the end of the war the experience gained and the staff trained should not be lost to the Flying Services. It is by no means necessary for officers at present filling administrative posts in connection with the supply of aircraft to be retained. A change of blood, elsewhere than in the Cabinet, would assist in the progress of the war. Self-appointed experts rarely possess efficiency.

The inspection departments of both the Royal Naval Air Service and the Royal Flying Corps might disappear with advantage. At present they appear to carry out three particular duties:—i. The prolongation of delay; ii, the accumulation of expense by needless rejections brought about by entire lack of experience; and iii, the addition of grim humour to the lives of aircraft manufacturers.

The Ministry of Munitions would find little difficulty in enlisting suitable personnel for this work. Many members of the existing staffs would continue to serve, as their efficiency is none the less present because it has been hidden beneath the fads and prejudices of those who were better advertised.

The departments undertaking the design of aircraft, if it is still considered advisable for such work to be carried out officially, would be amalgamated with the aircraft factories of both Services. A great part of necessary experimental work could be carried out by these factories on a fixed annual grant and at the request of private manufacturers who may desire information on matters involving expense which would not be justifiable in any dividend-paying businesses.

The results of such investigations would be available to all manufacturers. During the war both aircraft factories and the work undertaken by them would be under the supervision of the Ministry of Munitions to ensure a proper use of money.

Aeroplanes could in future be ordered in accordance with reports from the Front made by squadron commanders, from experience gained in their squadrons and submitted through the usual channels without alteration, but with further comment if necessary. The view that pilots individually are best qualified to voice opinions to the quality of an aeroplane is no sounder than to say that a motorist necessarily knows anything of motor engineering, yet opinion in the mass would be of high value.

Though naturally no pilot on active service could cause the production of an aeroplane of enhanced design or greatly increased efficiency, yet his views in combination with those of his brother officers might bring about the abolition of types of aeroplanes which, while picturesque in their actions, possess no charms for those whose duty it is to fly.

AIR WARFARE.

The following information and comment has been taken from the "Times":—

There are certain features of the official reports of the air warfare on the Western front during November which distinguish them from those of any previous month since the Somme offensive began on July 1st. Perhaps the most curious is the sudden cessation, halfway through the month, of any mention by German Main Headquarters of aerial engagements. The last being on Nov. 11th.

Another feature of such reports as were made in November—there were only three altogether—was their vagueness. On Nov. 4th Main Headquarters claimed that nine, and on Nov. 11th that 10, enemy machines were shot or brought down in air fights or by anti-aircraft guns, but not the slightest indication was given on either date of the time or place of these events. A third fact to be noted is that since the death of Böcke at the end of October the German Flying Service has become as anonymous as the R.F.C.

The wastage of aircraft in November was less than in any of the previous four months. According to the official communiqués, 148 British, French, and German machines are stated definitely to have been brought down, but this is not the complete total, because on two occasions British Headquarters reported that "many others" and "several others" beside the number mentioned were driven down.

Of the definite total 32 were British—admitted by General Headquarters to have been lost or not to have returned. As an off-set the British destroyed 24, captured seven, and drove down damaged 26 German machines. In addition five other enemy aeroplanes were brought down by members of the Royal Naval Air Service operating under the French military authorities.

The French claim 50 enemy machines. Of these, nine were

destroyed, four fell into the hands of the French, and 30 were brought down in aerial fights—and, presumably, wrecked.

[It is as well not to count on machines which are simply "driven down," as probably most of the crews descend unhurt, through mere engine damage, and others through sheer nerves.—Ed.]

The list of successful aviators is still headed by Lt. Guynemer, who has scored his 23rd victory. Guynemer has a record for "braces" which now surpasses that achieved by Böcke. In November alone he brought down two German aeroplanes on each of three days. Guynemer is followed by Lt. Nungesser and Adjudant Dorne, who respectively secured their 18th and 16th "victim" during the month.

For the three days on which reports were made, the Germans claim to have shot down 36 enemy machines.

The following table gives the number of aeroplanes "accounted for" since June 1st, as shown in the daily official reports of British, French, and German Headquarters:—

	British.	French.	German
June	7	28	37
July	48	31	86
August	26	42	121
September	48	68	206
October	42	25	104
*November	32	4	112
Total	203	198	666

* The figures for this month are subject to the above observations as to the incomplete German returns.

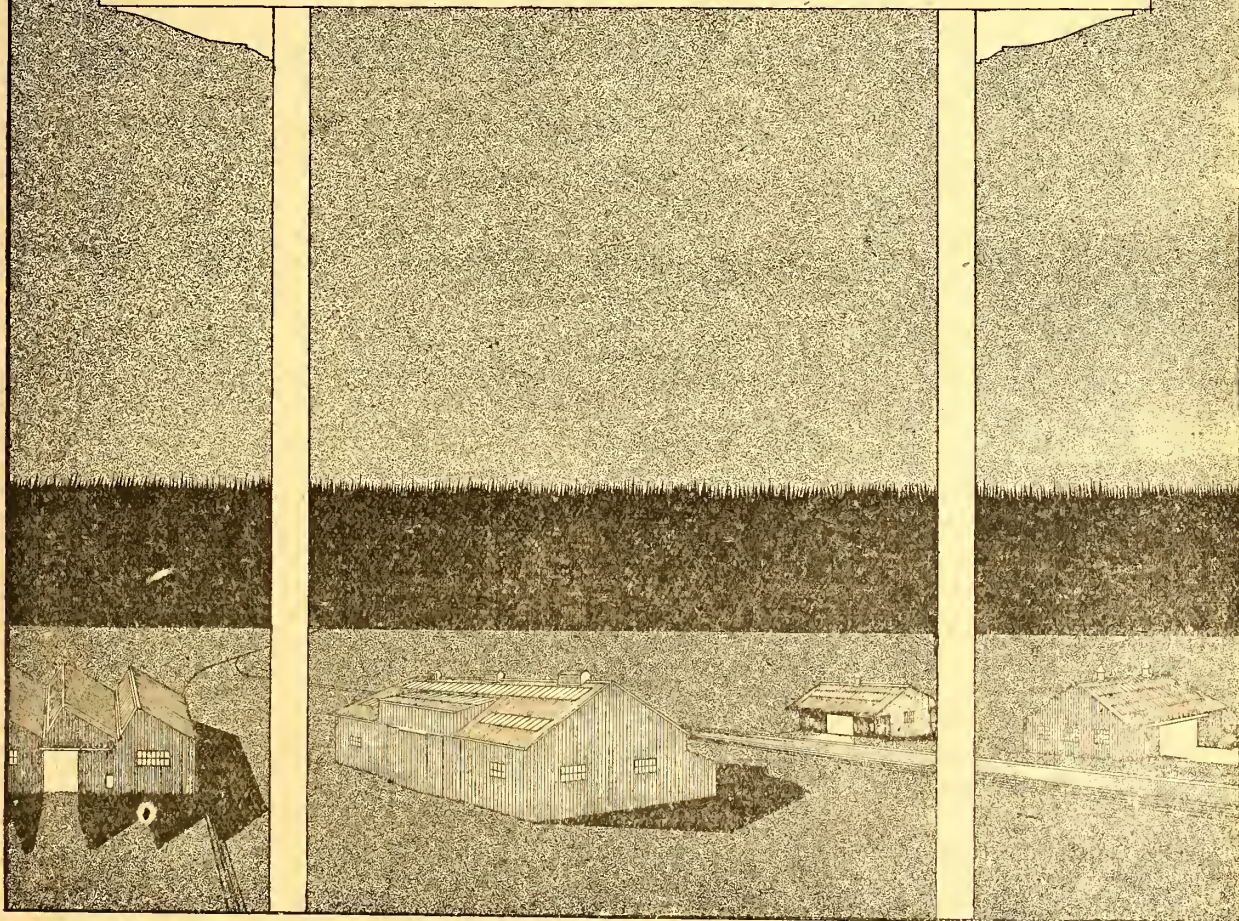
[It should be noted, however, that the British figure is for those admitted by G.H.Q., and does not include those "claimed" to have been driven down by the Germans, nor probably those smashed behind our lines, nor those returning with dead or wounded pilots or passengers, whereas the German figure is made up of the "claims" of both British and French pilots.—Ed.]

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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Nov. 28th, 1916.

ADMIRALTY, Nov. 23rd.

R.M.L.I.—Capt. (temp. Maj.) I. T. Courtney is granted temp. rank of Lt.-Col. on promn. to Act. Wing Comdr., R.N.A.S., Oct. 1st.

Nov. 24th.

R.N.A.S.—Flt. Comdr. to be Sqdn. Comdr.:—C. R. Finch-Noyes, June 30th.

Nov. 27th.

Flt. Sub-Lt. H. S. Kerby is reinstated with his original seny., March 21st, 1915.

To be Flt. Comdr.:—Lt.-Comdr. J. I. Harrison, R.N., Nov. 16th.

WAR OFFICE, Nov. 28th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers (Observers).—Sec. Lt. E. B. B. Jefferson, L'pool R., and to be sec'd., Aug. 10th. Sec. Lt. (temp. Capt.) H. G. Rickards, Lond. (Howitzer) Brigs., R.F.A., T.F.; temp. Sec. Lt. A. N. Nesbitt, R. Innis. Fus., and to be transfd. to Gen. List, Nov. 12th.

Equipment Officer, 1st Cl.—Temp. Lt. E. G. Toye, Gen. List, from the 3rd Cl., and to be temp. Capt. while so empld., Nov. 20th.

Equipment Officer, 2nd Cl.—From the 3rd Cl.:—Temp. Lt. E. J. Howard, Gen. List, Qmr. and Hon. Lt. L. Newman, City of Lond. Yeo., T.F. And to be temp. Lts. while so empld.:—Sec. Lt. R. K. C. Maguire, S.R.; Sec. Lt. K. D. Abercromby, S.R.; temp. Sec. Lt. J. W. Burt, Gen. List; temp. Sec. Lt. J. R. Grant, Gen. List; temp. Sec. Lt. S. E. Devonald, Gen. List; temp. Sec. Lt. J. H. Banks, Gen. List; Sec. Lt. E. Stokes, S.R.; Sec. Lt. W. M. Cumming, S.R.; Sec. Lt. J. L. Luntley, S.R.; Sec. Lt. L. Auker, Gen. List, Nov. 1st. Sec. Lt. B. J. Nicholson, S.R., Nov. 13th.

MEMORANDA.—Capt. the Hon. E. A. Stonor, R.F.C., Spec. Res., to be temp. Maj. (without pay and allowances of that rank) whilst specially empld., Nov. 25th (substituted for notification in "Gazette" of Nov. 24th).

Temp. Lt. G. Graham, Gen. List, a Flying Officer (Observer), takes rank and precedence in the R.F.C. and in the Army as if his appt. as temp. Lt. bore date Oct. 9th.

The Hon. C. E. St. George Caulfeild, late R.F.C., Spec. Res., to be temp. Lt. whilst empld. as a Recruiting Officer, Nov. 7th.

From the "London Gazette" Supplement, Nov. 29th, 1916.

WAR OFFICE, Nov. 29th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flt. Comdrs.—Temp. Lt. H. D. Jensen, Gen. List, from a Balloon Officer, and to be temp. Capt. whilst so empld., Oct. 24th. Capt. F. C. Baker, D. of Corn. L.I., Spec. Res., from a Flying Officer and to remain sec'd., Nov. 10th. From Flying Officers, and to be temp. Cpts. whilst so empld.:—Sec. Lt. R. Gregory, Conn. Rang., Spec. Res., Lt. P. C. Campbell, Arg. and Suth'd. Highrs., Spec. Res., Nov. 17th.

Flying Officers.—Sec. Lt. K. I. Mackenzie, Arg. and Suth'd. Highrs., and to be sec'd., July 17th. Temp. Capt. J. M. Heap, A.S.C., and to be transfd. to Gen. List, Nov. 1st. Temp. Sec. Lt. R. N. G. Atkinson, Midd'x R., and to be transfd. to Gen. List; Capt. L. S. Platt, 17th Lrs.; Sec. Lt. I. M. Davies, Welsh R., and to be sec'd., Nov. 2nd. Sec. Lt. R. A. Grosvenor, 2nd D. Gds., Spec. Res.; temp. Sec. Lt. R. D. C. Blake, 10th Res. Regt. of Cav., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) J. H. Cooper, Gen. List; Sec. Lt. W. B. Melville, Spec. Res.; temp. Sec. Lt. (on prob.) E. D. Howard, Gen. List, Nov. 6th. Temp. Sec. Lt. F. G. Litchfield, Gen. List; temp. Lt. H. Norton, R. Lanc. R., and to be transfd. to Gen. List; temp. Sec. Lt. B. C. Rice, Gen. List, from a Flying Officer (Observer), with seny. from Nov. 22nd, 1915; temp. Sec. Lt. F. H. Reynell, Gen. List; Sec. Lt. (on prob.) F. C. Craig, Spec. Res., Nov. 7th. Temp. Lt. G. E. Giles, Gen. List, from an Equipment Officer, 3rd Cl.; temp. Sec. Lt. (on prob.) C. F. Crapp, Gen. List; temp. Sec. Lt. (on prob.) J. H. Gotch, Gen. List; temp. Sec. Lt. (on prob.) E. O. L. Bell, Gen. List; Lt. (temp. Capt.) F. P. Don, Sco. Horse Yeo., T.F., from a Flying Officer (Observer), with seny. from June 16th, Nov. 8th. Lt. A. T. Adams, Wilts. R., Spec. Res.; temp. Sec. Lt. G. W. Shuter, Gen. List; Lt. J. G. S. C. Smith-Grant, R. Scots, T.F.; Sec. Lt. C. F. Smith, L'pool R., T.F.; Sec. Lt. F. P. Williams, Spec. Res.; Sec. Lt. F. H. Holdsworth, Spec. Res., Nov. 9th. Sec. Lt. G. A. Masters, Lond. R., T.F., Nov. 11th. Temp. Sec. Lt. A. J. Pearson, M.C., Machine Gun Corps, and to be transfd. to Gen. List, Nov. 13th.

Balloon Officer.—Sec. Lt. (on prob.) E. L. Pape, Spec. Res., Aug. 17th.

Equipment Officer, 1st Cl.—Capt. E. R. L. Corballis, R. Dub. Fus., from a Flt. Comdr., Oct. 16th.

2nd Cl.—From the 3rd Cl., and to be temp. Lts. whilst so empld.:—Sec. Lt. C. R. Fry, Spec. Res.; Sec. Lt. E. G. A. Leffere, Spec. Res., Nov. 1st. Sec. Lt. N. Turner, Spec. Res., Nov. 13th.

3rd Cl.—Temp. Sec. Lt. J. H. Thorpe, Gen. List, Oct. 1st. Sec. Lt. (temp. Lt.) W. Redmond, Lan. Fus., T.F.; temp. Sec. Lt. (on prob.) L. S. R. Poole, Gen. List; temp. Sec. Lt. (on prob.) C. Rawdon-Schofield, Gen. List; temp. Sec. Lt. F. W. Poat, Gen. List; temp. Sec. Lt. (on prob.) D. G. Robinson, Gen. List; Sec. Lt. (on prob.) W. L. Shaw, Spec. Res.; Sec. Lt. (on prob.) G. J. C. Gunn, Sco. Rif., Spec. Res., and to be sec'd.; Sec. Lt. (on prob.) H. Hoad, Spec. Res.; Sec. Lt. (on prob.) A. Graham, Spec. Res.; Sec. Lt. (on prob.) H. J. G. Dyer, Spec. Res.; temp. Sec. Lt. H. Haddon, Gen. List; temp. Sec. Lt. (on prob.) J. P. Burden, Gen. List; temp. Sec. Lt. T. F. Allen, Gen. List; temp. Sec. Lt. (on prob.) T. F. Braines, Gen. List; temp. Sec. Lt. D. Armitage, Gen. List; temp. Sec. Lt. R. W. Atchley, Gen. List; Sec. Lt. L. Davis, Spec. Res.; temp. Sec. Lt. H. Cooke-Smith, Gen. List; Sec. Lt. (on prob.) T. Cooper, Spec. Res.; temp. Sec. Lt. S. F. Barton, Gen. List; temp. Sec. Lt. R. L. Cobb, Gen. List; temp. Sec. Lt. J. C. Courtice, Gen. List; Sec. Lt. E. P. Lyon, Spec. Res.; Sec. Lt. M. J. James, Spec. Res.; temp. Sec. Lt. J. W. Jennings, Gen. List; temp. Sec. Lt. N. H. Knock, Gen. List; Sec. Lt. G. W. Longstaff, Spec. Res.; temp. Sec. Lt. D. M. Mackie, Gen. List; Capt. L. H. Tosswill, Worc. R., Spec. Res., and to be sec'd.; temp. Sec. Lt. S. N. Veitch, Durh. L.I., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) L. Wigley, Gen. List; temp. Sec. Lt. (on prob.) C. E. Tebbis, Gen. List; temp. Sec. Lt. (on prob.) F. Ward, Gen. List; temp. Sec. Lt. (on prob.) L. G. Stevenson, Gen. List; Sec. Lt. (on prob.) W. H. R. Skudder, Spec. Res.; temp. Sec. Lt. (on prob.) K. A. Smith, Gen. List; temp. Sec. Lt. (on prob.) L. L. W. Smythe, Gen. List; temp. Sec. Lt. (on prob.) H. Stansfield, Gen. List; Sec. Lt. (on prob.) J. F. B. Smith, Spec. Res., Nov. 7th.

MEMORANDA.—1st Cl. Air Mech. G. M. Turnbull, from R.F.C., to be temp. Sec. Lt. for duty with the Mil. Wing of that Corps, Aug. 10th.

A. S. Ellerton to be temp. Hon. Capt. whilst empld. as an Insp., A.I.D., Oct. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. J. G. Hutt resigns his commn., Nov. 30th. The notification in "Gazette" of Aug. 22nd of the appt. of Sec. Lt. (on prob.) G. M. Turnbull is cancelled.

Following Sec. Lts. (on prob.) are confirmed in rank:—W. B. Melville, F. P. Williams, F. H. Holdsworth, L. Davies, M. J. James, H. Stroud, L. W. White.

To be Sec. Lts. (on prob.):—W. E. Nuttall, Oct. 23rd. N. Martin, Nov. 5th. A. G. Griggs, Nov. 6th. J. G. Hope, Nov. 14th.

TERRITORIAL FORCE.—INFANTRY.—Temp. Sec. Lt. B. B. Henry, from Gen. List (R.F.C.), to be temp. Sec. Lt. (att'd.) (Nov. 30th, but with seny. from Aug. 5th).

From the "London Gazette," Dec. 1st, 1916.

ADMIRALTY, Nov. 14th.

Nov. 29th.—To be temp. Flt. Lt.:—T. D. Hallam, D.S.C., Sept. 29th, 1915.

WAR OFFICE, Dec. 1st

STAFF.—The following temp. appt. is made at the War Office:—

Staff Lt.—Capt. G. W. Williamson, M.C., Manch. R., S.R., from a Flying Officer, and to remain sec'd., vice Capt. E. S. Skipper, R.F.C., S.R., Nov. 11th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers.—Sec. Lt. L. W. White, S.R., Nov. 5th. Temp. Lt. W. E. Sandys, A.S.C., and to be transfd. to Gen. List; temp. Lt. W. H. Segrave, A.S.C., and to be transfd. to Gen. List; Sec. Lt. A. G. D. Alderson, Worc. R., Spec. R., and to be sec'd.; Sec. Lt. F. K. Laverton, Glouc. R., Spec. R., and to be sec'd.; Lt. J. Whittaker, E. Lan. R., T.F.; temp. Sec. Lt. N. C. McClelland, Gen. List, Nov. 8th. Temp. Sec. Lt. H. M. Over, R. Fus., and to be transfd. to Gen. List; Sec. Lt. G. Vaughan-Jones, E. Anglian Divl. Sig. Co., R.E., T.F.; Sec. Lt. E. T. Curling, Lond. R., T.F.; Sec. Lt. (temp. Lt.) P. J. G. Powell, A.S.C., and to be sec'd.; temp. Sec. Lt. B. F. Rowe, R. Fus.; temp. Sec. Lt. F. M. Kitto, Welsh R., and to be transfd. to Gen. List; temp. Sec. Lt. H. G. Spearpoint, Gen. List, Nov. 9th. Lt. S. J. Pepler, 74th Canadian Inf. Bn., Nov. 10th. Sec. Lt. H. Stroud, Spec. Res., Nov. 11th.

Equipment Officer, 3rd Cl.—The appt. of temp. Sec. Lt. (on prob.) J. Jardine, R.E., notified in "Gazette" of Nov. 7th is cancelled.

Experimental Officers.—(Graded as Equipment Officers, 1st Cl.).—From Equipment Officers, 1st Cl., and to retain their temp. rank whilst so empld.:—Temp. Lt. (temp. Capt.) C. E. Prince, Westmorland and Cumberland Yeo., T.F., seny. from Nov. 29th, 1915; Lt. (temp. Capt.) A. M. Low, Spec. Res., seny. from Dec. 22nd, 1915, Nov. 1st.

Asst. Experimental Officers.—(Graded as Equipment Officers, 3rd Cl.).—Temp. Sec. Lt. F. C. Wilkinson, Arg. and Suth'd. Highrs., and to be transfd. to Gen. List, Aug. 3rd. From Equip-

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ment Officers, 3rd Cl., Nov. 1st:—Temp. Capt. A. G. Parsons, Gen. List, seny. from Oct. 20th, 1915; Sec. Lt. H. J. Poole, Spec. Res., seny. from Jan. 1st; Sec. Lt. E. W. Bowen, Spec. Res., seny. from 7th Jan.; temp. Sec. Lt. J. H. Mackie, Gen. List, seny. from May 20th; Sec. Lt. F. A. Harper, Spec. Res., seny. from May 25th; Sec. Lt. L. Mantell, Spec. Res., seny. from Aug. 13th.

ROYAL REGIMENT OF ARTILLERY.—R.H. and R.F.A.—Sec. Lt. T. Gregory, Spec. Res., relinquishes the acting rank of Capt. on ceasing to comd. an Anti-Aircraft Section, July 20th.

MEMORANDUM.—Sec. Lt. (temp. Capt.) L. Moss, A.S.C., relinquishes his temp. rank on ceasing to be empld. with R.F.C., Oct. 30th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—R. H. B. Ker, from Lt., 3rd Pioneer Bn., Canada, to be Lt., Dec. 2nd.

Sec. Lt. I. L. Knight resigns his commn., Dec. 2nd.

Sec. Lts. (on prob.) confirmed in their rank:—H. J. G. Dyer, E. L. Pape, W. H. R. Skudder.

To be Sec. Lts. (on prob.):—J. A. Hutchison, F. H. Baguley, N. S. Cameron, Oct. 19th. T. Elder-Hearn, Nov. 7th.

TERRITORIAL FORCE.—INFANTRY.—R. LANCES. R.—Capt. J. S. Fothergill is secd. for duty under the Director of Aircraft Equipment, Nov. 15th.

* * *

A supplement to the "London Gazette" of Dec. 1st, 1916, contains a dispatch, dated Oct. 1st, from General Sir Archibald Murray, Commander-in-Chief of the Egyptian Expeditionary Force, covering the operations of his force between June 1st and September 30th, 1916. The following paragraphs have reference to the work of the Royal Flying Corps:—

On July 19th a reconnaissance by the R.F.C. revealed the fact that a large enemy force had moved westwards from El Arish and established itself on the line Bir El Abd-Bir Jameil-Bir Bayud.

I cannot speak too highly of the work of the R.F.C. during the whole period. Their work was extremely arduous and exhausting. The average total daily reconnaissances during the period amounted to 23½ hours, and during the first five days of August to as much as 31½ hours. Many pilots and observers were out two or three times a day for several consecutive days under very accurate anti-aircraft fire, and were frequently engaged in air combats with enemy machines of

superior power. Special commendation is due to Lt.-Colonel P. B. Joubert, Officer Commanding R.F.C., and to Major H. Blackburn, R.F.C., who commanded the detachment at Kantara.

A second dispatch, dated Oct. 13th, contains a list of officers and others whose service Sir A. Murray desires to bring to notice, among which are the following:—

R.F.C.—Groves, Maj. (temp. Lt.-Col.) P. R. C., Shrops. L.I.; Carden, Maj. (temp. Lt.-Col.) A. D., R.E.; Joubert de la Ferté, Capt. (temp. Lt.-Col.) P. B., R.A.; Fraser, Capt. C., N. Staff. R.; Albrecht, Capt. V. A., M.C., Manch. R.; Grant-Dalton, Capt. S., D.S.O., York R.; Jenkins, Capt. F. H., Sp. Res.; Watt, Capt. O., Australian F.C.; Minchin, Lt. (temp. Capt.) F. F., M.C., Sp. Res.; Tipton, Lt. (temp. Capt.) R. J., R.F.A.; Pretymann, Lt. E. R., Som. L.I.; James, Lt. H. H., Manch. R.; MacLaren, Sec. Lt. A. S. C., M.C., K.O.S.B. (Sp. Res.); Coates, Sec. Lt. W. A.; Brown, temp. Sec. Lt. J., R.F.A. (died of wounds); Minter, Sec. Lt. M., Sp. Res.; West, temp. Sec. Lt. T. J.; Muir, temp. Sec. Lt. S. K.; Paris, temp. Sec. Lt. D. K., M.C.; McMahon, 1st Cl. Wrnt. Off. P., Australian F.C.

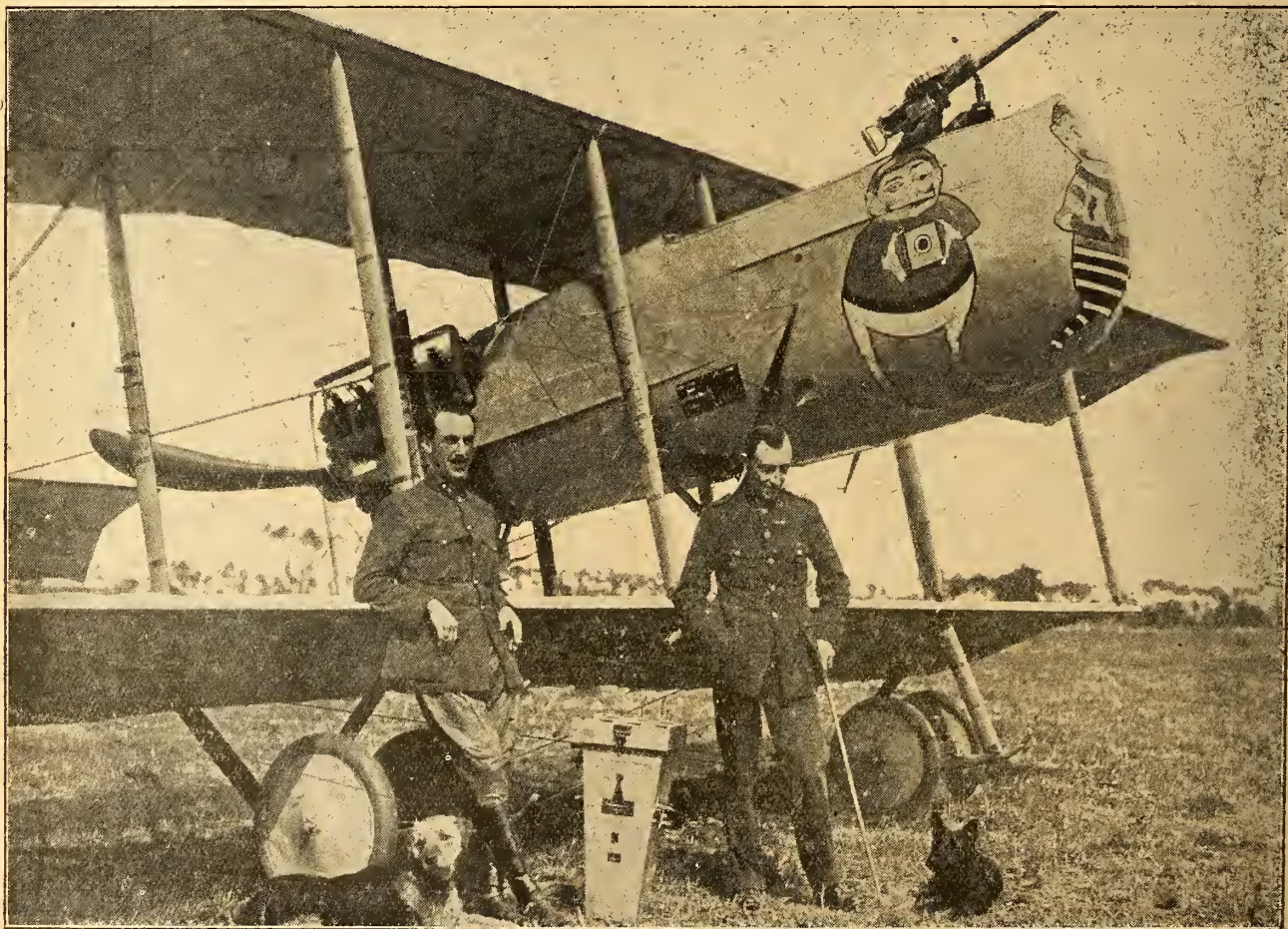
Harman, No. 222 Flt.-Sergt. C. J., A.F.C.; Lewis, No. 63 Flt.-Sergt. A. E.; King, No. 874 Flt.-Sergt. C. R.; Hunt, No. 3552 Cpl. J. S.; Roberts, No. 3201 Cpl. A.; Bacon, No. 265 1st Cl. Air Mech. L. B., A.F.C.; Cox, No. 3068 Cpl. A.; Holmes, No. 3094 1st Cl. Air Mech. H.

* * *

From the "London Gazette" Supplement, Dec. 2nd, 1916.

WAR OFFICE, Dec. 2nd.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers.—Sec. Lt. V. D. Siddons, North'n R., T.F., Oct. 20th. Sec. Lt. C. D. Fellowes, Staff. Yeo., T.F., Sec. Lt. F. W. H. Thomas, Staff. Yeo., T.F., Lt. L. L. MacLean, 8th Gurkha Rif., Ind. Army, Temp. Lt. R. M. Wynne-Eyton, Machine Gun Corps, and to be transfd. to Gen. List, Lt. S. J. M. White, Norf. R., T.F., from Machine Gun Corps, Sec. Lt. G. E. Wilson, Sco. Rif., and to be secd., Oct. 23rd. Sec. Lt. A. W. Robinson, E. Sur. R., Spec. Res., and to be secd., Sec. Lt. J. V. Tunbridge, Australian Flying Corps, Sec. Lt. S. I. Winter-Irving, Australian Flying Corps, Sec. Lt. R. F. Baillieu, Australian Flying Corps, Oct. 24th. Lt. G. C. H. Culley, Norf. R., T.F., from Machine Gun Corps, Oct. 25th. Temp. Sec. Lt. W. Ross, R.W.



Capt. d'Hendecourt and Adjutant Roudean of the Belgian Army, both decorated with the Military Cross for good photographic work. Their camera is shown on the ground between them. The humorous decoration of their Farman is worthy of note.

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Fus., T.F., Sec. Lt. L. Butler, Yorks L.I., T.F., Nov. 9th. Temp. Sec. Lt. B. A. Taylor, Gen. List, Nov. 11th. Temp. Sec. Lt. P. J. Barnett, R. Fus., and to be transf'd. to Gen. List, Sec. Lt. D. F. Stevenson, Sher. Rangers Yeo., T.F., Sec. Lt. (temp. Lt.) R. L. Whalley, E. Lan. R., T.F., Temp. Sec. Lt. (on prob.) A. C. Wyness, Gen. List, Capt. C. E. Bryant, D.S.O., 7th Hrs., and to be sec'd., Lt. J. Potter, High. L.I., and to be sec'd., Nov. 13th. Lt. J. W. Boyd, 74th Canadian Inf. Bn., Sec. Lt. D. H. Bell, M.C., Cam'n Highrs., and to be sec'd., Sec. Lt. (on prob.) W. D. B. Taylor, Spec. Res., Sec. Lt. (on prob.) J. Mitchell, Spec. Res., Temp. Sec. Lt. H. P. Solomon, Gen. List, Lt. H. Kent, L'pool R., and to be sec'd., Temp. Sec. Lt. R. L. Graham, R.A., and to be transf'd. to Gen. List, Sec. Lt. T. Ure, Sco. Rif., T.F., Temp. Sec. Lt. J. Clinkskill, Gen. List, from an Equipment Officer, 3rd Cl., Temp. Sec. Lt. R. T. Whitney, Gen. List, Nov. 14th. Sec. Lt. (on prob.) G. J. Scaramanga, N. Staff. R., Spec. Res., and to be sec'd., Temp. Sec. Lt. (on prob.) H. J. Green, Gen. List, Sec. Lt. (on prob.) T. W. L. Dickson, Spec. Res., Nov. 15th.

The appointment of Sec. Lt. (temp. Capt.) W. S. Farren, Hamp. Aircraft Parks, R.F.C., T.F., notified in "Gazette" of Nov. 8th, is cancelled.

Balloon Officer.—Temp. Sec. Lt. G. A. Hoghton, Gen. List, Oct. 14th.

Equipment Officer, 3rd. Cl.—Sec. Lt. (on prob.) R. R. Prentice, Spec. Res., Oct. 9th. Capt. (temp. Maj.) R. A. Constantine, York. R., T.F., Sec. Lt. (temp. Capt.) A. Sowden, W. York. R., T.F., Qrmr. and Hon. Lt. H. Farquharson, Glouc. R., T.F., Tem. Sec. Lt. E. Vevers, R. War. R., Temp. Sec. Lt. (on prob.) A. S. Poynton, R.E., Temp. Sec. Lt. B. E., Hobbs, Gen. List, Nov. 1st.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. G. L. Faulkner resigns his commn., Dec. 3rd.

TERRITORIAL FORCE.—YEOMANRY.—NOTTS (SHERWOOD RANGERS).—Sec. Lt. D. F. Stevenson is sec'd. for duty with the R.F.C., Nov. 13th.

STAFFS.—Sec. Lt. C. D. Fellowes is sec'd. for duty with R.F.C., Oct. 23rd.

* * *

From the "London Gazette" Supplement, Dec. 4th, 1916.

WAR OFFICE, Dec. 4th.

REGULAR FORCES.—The following Wt. and N.C.Os. to be temp. Sec. Lts. (on prob.) for service in the Field:—

MEMORANDA.—For duty with R.F.C.—Cpl. K. P. Ewart, from a Can. Divl. Sig. Co., Oct. 26th. Sgt. C. Dixon, from H.A.C., T.F.; Spr. J. R. Smith, from Hdqrs., a Can. Divn., Oct. 29th. Sgt. H. R. Wilkinson, from Can. Mach. Gun Corps; Cpl. T. W. George, from Can. A.S.C., Nov. 5th. Qrmr.-Sgt. S. McLaughlin, from Can. A.S.C.; Gnr. F. H. Bronskill, Can. Fld. Artil., Nov. 6th.

ESTABLISHMENTS.—R.F.C.—Squadron Comdr.—Capt. D. E. Stodart, S.R., from a Flt. Comdr., and to be temp. Maj. while so empld., Sept. 25th.

Flying Officers.—Temp. Lt. A. H. Peck, Devon R., and to be transf'd. to Gen. List, Oct. 4th. Temp. Sec. Lt. G. E. Gibbs, Wilts R., and to be transf'd. to Gen. List, Oct. 11th. Sec. Lt. R. L. Clegg, Lan. Fus., S.R., from a Flying Officer (Observer), Oct. 18th, but with seny. from June 1st. Temp. Capt. F. H. V. Bevan, S. Wales Bord., and to be transf'd. to Gen. List, Oct. 23rd. Temp. Capt. J. A. D. Dempsey, R. Ir. Fus., and to be transf'd. to Gen. List, Oct. 25th. Sec. Lt. J. Thornton, R. Scots (since decd.), and to be sec'd., Nov. 8th. Temp. Lt. G. S. Frame, R.E., Temp. Sec. Lt. H. F. Paton, Gen. List, Nov. 10th. Sec. Lt. (temp. Lt.) R. Winnicott, Devon R., T.F., Nov. 11th.

Flying Officer (Observer).—The appointment of Capt. H. G. ffiske, R.F.A., T.F., notified in the "Gazette" of Nov. 3rd, is antedated to Sept. 1st.

Comdt.—(Graded as a Park Comdr.)—Capt. S. A. Hebden, S.R., from an Equipment Officer, 1st Cl., and to be temp. Maj. while so employed, Sept. 15th.

Staff Officer, 3rd Cl.—(Graded for purposes of pay as a Staff Capt.)—Sec. Lt. W. L. Birch, W. York R., T.F., from a Flying Officer, and to be temp. Capt. while so employed, Sept. 9th.

Equipment Officers, 1st Cl.—From the 3rd Cl., and to be temp. Cpts. while so employed:—Temp. Lt. C. Porri, Gen. List, Oct. 1st. Lt. T. W. Winter, S.R., Nov. 1st.

3rd. Cl.—Sec. Lt. (on prob.) A. C. Day, S.R., Sept. 29th (substituted for the notification in the "Gazette" of Oct. 19th).

ROYAL REGT. OF ARTILLERY.—R.H. and R.F.A.—Sec. Lt. W. R. A. McGee to be acting Capt. while commanding an Anti-Aircraft Batt., Sept. 15th.

MEMORANDA.—The following from R.F.C., to be temp. Sec. Lts. (on prob.) for duty with the Mil. Wing of that Corps:—Sergt. G. Lynch, Nov. 9th. Acting Cpl. C. G. J. Silcock, Nov. 24th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The Christian names of Sec. Lts. Charles John Raymond Milton and John Standen Shaw are as now described, and not as in the "Gazettes" of March 30th, 1916, and Jan. 6th, 1916, respectively.

Sec. Lts. (on prob.) confirmed in their rank:—R. R. Prentice, W. D. B. Taylor, P. R. Aitken, W. G. Duffield, J. Mitchell, T. Cooper, F. C. Craig, T. W. L. Dickson. J. Witt-Mann to be Sec. Lt., Sept. 10th. To be Sec. Lts. (on prob.):—A. C. Simpson, Oct. 10th. R. H. Moore, Oct. 12th. Capt. C. J. Thomsen, Australian Imp. Force, Oct. 23rd. S. Blackley, Nov. 9th. V. A. B. Learoyd, H. D. Lehmann, Nov. 16th. E. N. L. White, Dec. 1st.

TERRITORIAL FORCE.—R. G. A.—2ND LANCS.—Lt. E. A. Thoniaš is seconded for duty with the R.F.C., Nov. 15th.

THE COURT CIRCULAR.

BUCKINGHAM PALACE, Nov. 29th, 1916.

The following Officers had the honour of being received by the King, when His Majesty invested them with the Insignia of Companions of the Order into which they have been admitted:—

THE DISTINGUISHED SERVICE ORDER.—Sqn. Comdr. JOHN CULL, R.N.A.S.

Capt. ALAN WILKINSON, Hampshire Regt., attd. R.F.C.

The King then conferred the following decoration:—

THE DISTINGUISHED SERVICE CROSS.—Flt. Sub-Lt. HERBERT HALL, R.N.A.S.

* * *

BUCKINGHAM PALACE, Dec. 2nd.

The following Officer had the honour of being received by the King this morning, when His Majesty invested him with the Insignia of Companion of the Order into which he has been admitted:—

THE DISTINGUISHED SERVICE ORDER.—Major SEATON MASSY, 29th Punjabis, Indian Army, attached R.F.C.

The King then conferred decorations as follows:—

THE MILITARY CROSS.—Capt. CHARLES CHAPMAN, R.F.C.

Capt. JACOB SWART, R.F.C.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Nov. 29th.—Lt.-Comdr.—J. I. Harrison, graded as Flt. Comdr., seny. Nov. 16th.

The following have been entered as Proby. Flt. Officers (temp.), seny. as stated, and all apptd. to "President," addl., for R.N.A.S.:—G. B. G. Scott, C. G. Brock, E. C. R. Stoneman, and A. G. A. Spence, all Oct. 28th; G. Towers (Engr. Sub-Lt., R.N.R., temp.), Nov. 25th (temp. commn. as Engr. Sub-Lt., R.N.R. terminated); E. J. Addis (C.P.O.), L. W. E. Leage (Act. P.O.), N. R. Harben, C. I. Greenwood, F. A. Frost, V. H. Clift, J. F. R. Kitchin, H. L. P. Lester, J. C. Grant, E. H. S. Low, C. Lowther, and W. E. B. Oakley, all Dec. 3rd.

Mr. E. Gough, entered as Wt. Officer, 2nd Grade (temp.), seny. Nov. 27th, and apptd. to "President," addl., for R.N.A.S.

Lt. (R.N.V.R., temp.)—G. W. F. Fraser, granted Act. rank of Lt.-Comdr. (R.N.V.R.), seny. Nov. 26th.

Nov. 30th.—Eng. Sub-Lt. (temp. R.N.R.)—C. W. Halfhide, entered as Proby. Flt. Officer (temp.), seny. Nov. 28th.

The following have been granted temp. commns. as Sub-Lt. (R.N.V.R.), seny. as stated, and all apptd. to "President," addl., for R.N.A.S.:—R. A. Tanner (Act. Air Mech. 1st Grade) and C. N. Ellen, both Nov. 27th; A. A. Allan, Nov. 28th.

Dec. 1st.—The following have been entered as Proby. Flt. Officers (temp.), seny. as stated:—H. le R. Wallace, Oct. 9th; J. P. Hales, Oct. 12th; and H. E. Grundy, Nov. 9th.

Dec. 2nd.—Lieut.—L. G. G. Groves, to "President," addl., for service in R.N.A.S. (temp.), Nov. 30th.

Mr. A. H. Lofft, entered as Proby. Flt. Officer (temp.), seny. Nov. 22nd, and apptd. to "President," addl., for R.N.A.S.

Dec. 5th.—Sub-Lieut. (Temp. R.N.V.R.)—H. S. Keightley, apptd. to "President," addl., for duty with R.N.A.S., seny. Dec. 2nd.

Messrs. A. Williams, E. C. St. John, and C. L. D. Willcox, all granted temp. commns. as Lieut. (R.N.V.R.), seny. Dec. 2nd, and apptd. to "President," addl., for R.N.A.S.

ADMIRALTY COMMUNIQUE'S.

Nov. 28th, 11.55 p.m.—The Commodore at Dunkirk has been informed by the French authorities that they have brought down an aeroplane at 2.15 p.m. to-day carrying two naval lieutenants with a large-scale map of London on board.

[These officers may possibly be those who raided London on that day.—Ed.]

Nov. 29th.—During the course of yesterday afternoon (28th inst.) an attack was carried out by naval aeroplanes upon the harbour at Zeebrugge, but owing to weather results could not be observed.

All machines returned safely.

Dec. 2nd.—On Nov. 29th a squadron of British naval aeroplanes, operating against the Bulgarian coast, attacked the enemy seaplane base at Gereviz, effecting great damage.

On Nov. 30th a bomb attack was carried out on Doksambos, and on the same day a troop train near Porna (on the Drama railway) was attacked by two aeroplanes. The men in charge

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of the engine were wounded and fell out, the train itself proceeding at a high speed with no one in charge.

* * *

The following operations have been carried out by squadrons of naval aeroplanes operating against the Bulgarian coast between Nov. 23rd and Nov. 28th:—

Nov. 23rd.—A bomb attack was carried out on Karjani.

Nov. 24th.—The railway station at Angista and stores in the vicinity were bombed, a direct hit being obtained on the station itself. On the same day an enemy camp near Rajolivos was bombed, and the enemy swept with machine-gun fire.

Nov. 25th.—An attack was carried out on the enemy aerodrome at Drama, and considerable damage was done.

Nov. 26th.—Further bomb attacks were carried out in the Drama area and at Angista.

Nov. 27th.—Porna and Doksambos were attacked.

Nov. 28th.—Drama aerodrome and railway station were again attacked, with very satisfactory results.

All our machines returned safely.

* * *

The Secretary of the Admiralty made the following announcement on Dec. 2nd:—

The King has been pleased to approve the award of the Distinguished Service Order to Flt. Sub-Lt. EDWARD L. PULLING, R.N.A.S., and of the Distinguished Service Cross to Flt. Lt. EGBERT CADBURY and Flt. Sub-Lt. GERRARD W. R. FANE, of the R.N.A.S., in recognition of their distinguished services on the occasion of the destruction of a Zeppelin airship off the Norfolk coast, in early morning of Tuesday, Nov. 28th, 1916.

Flt. Sub-Lt. Pulling is an Old Boy of St. Anne's, Redhill. On leaving school he became a telegraphist at Redhill Post Office.

Flt. Lt. Egbert Cadbury is 23 years old. At the outbreak of war he left Trinity College, Cambridge, where he was studying for the law, and joined the "Zarifa" as an A.B., the vessel being a converted yacht manned mostly by Cambridge men. After nearly a year at sea he entered the R.N.A.S., gained his pilot's certificate, and has been stationed on the East Coast for nearly 18 months.

He is the youngest son of Mr. George Cadbury, chairman of Messrs. Cadbury Bros., Ltd., of Bournville, Birmingham, who acquired the "Daily News," but disposed of his shares some time ago and retired from the board of directors.

Flt. Lt. Fane joined the R.N.A.S. on July 22nd of last year as a flight sub-lt. He is only 19 years of age, and entered the service straight from Charterhouse. He has done a great deal of flying.

* * *

All those concerned with Naval aviation will hear with regret that the injuries received by Sqdn.-Comdr. R. L. G. Marix, R.N., D.S.O., in his recent aeroplane accident, have taken a serious turn and the amputation of one of his legs has been necessary. He is going on as well as can be expected, but his condition is naturally still serious. His many friends will join in wishing him speedy recovery.

* * *

CASUALTY LIST.

Nov. 29th.—PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMANY.—Sturdy, W., Air Mechanic 2nd Grade.

PERSONAL NOTICES.

MARRIAGES.

LIDDERDALE—WALKER.—The marriage arranged between Flt. Comdr. J. H. Lidderdale, R.N., and Maud, youngest daughter of Mr. and Mrs. J. Hanson Walker, 2, Queen's Elm Square, Chelsea, will take place on Saturday, Dec. 16th, at St. Peter's, Cranley Gardens, at 2.30. There will be no invitations or reception, but friends will be very welcome at the church.

Flt. Comdr. Lidderdale was an Assistant-Paymaster R.N. when he joined the Naval Wing, R.F.C., as secretary to Capt. Godfrey Paine, R.N. (now Commodore), the Commandant of the Central Flying School then in process of formation. He is one of the earliest members of the R.N.A.S., and had much to do with the success of the C.F.S., owing to the methodical way in which his duties were done. All his old friends in the R.N.A.S. and R.F.C. will wish him and his bride every happiness.

* * *

SMYLIE—MATHESON-HOEGERSTAEDT.—On Nov. 27th Flt. Sub-Lt. Gilbert Formby Smylie, D.S.C., R.N., the son of the late James Smylie of Manchester, was married to Juliet Electra, daughter of Edmund Matheson-Hoegerstaedt of Petrograd, at St. Lawrence's, Whitechurch, Little Stanmore, by the Rev. C. W. Scott-Moncrieff, M.A.

MILITARY.

G.H.Q. COMMUNIQUÉS

Nov. 28th, 10.30 a.m.—Yesterday much successful artillery and reconnaissance work was accomplished by our aircraft and several places of military importance were attacked and bombed. In one instance a large explosion was caused.

In aerial-combats one hostile aeroplane was destroyed and one driven down damaged. Two of our machines are missing.

WAR OFFICE COMMUNIQUÉ.

The General Officer Commanding British Forces in the Balkans reports:—Dec. 3rd.—The enemy's camp near Seres was bombed by our aeroplanes and serious damage inflicted.

* * *

HOME COMMAND COMMUNIQUÉS.

Nov. 28th, 4.10 p.m.—The latest police reports show that the damage and casualties caused by last night's air raid were very slight, although over 100 bombs are known to have been dropped.

One woman died from shock, while five men, seven women, and four children were injured.

In one town 15 houses were seriously and 20 slightly damaged. At the other places at which bombs were dropped the damage was insignificant.

No damage of military importance was caused.

Nov. 28th, 7.15 p.m.—Official police reports show that nine persons were injured in London this morning by the bombs dropped by the hostile aeroplane.

[The earlier official reports on the airship and aeroplane raids were published last week.—Ed.]

Among those mentioned in the Egyptian dispatches are several officers whose names are familiar to those who have been concerned with aviation in its early days. Colonel Carden was one of the earliest aeronautical officers, having belonged to the old Balloon Section R.E. Colonel Joubert de la Ferté joined the R.F.C. on its formation, and was Flt.-Comdr. in No. 3 Squadron at the outbreak of war. Major Harold Blackburn was the inventor and constructor of the Walton and Edwards "Colossoplane" at Brooklands. Capt. Oswald Watt was one of the earliest Australians to fly, having learned in France, and having done much flying in Egypt before the war. He won the Legion of Honour and the Croix de Guerre as an officer of the French Service d'Aviation before transferring to the Australian Flying Corps.

* * *

An Army Order issued on Nov. 28th announces that in future officers who have qualified as observers with the Royal Flying Corps in the field may, within the authorised establishment, be appointed Flying Officers (Observers) instead of passing through the intermediate grade of Qualified Observers.

As Flying Officers (Observers) they will receive pay at the rate of 12s. a day, and flying pay at 5s. a day will be issued continuously while they are employed as observers in an area of active operations.

It has also been decided that officers so appointed shall take their places in the list of Flying Officers from the date on which they embark for overseas in the case of officers joining at home, or from the date of joining the Royal Flying Corps in the field in the case of those obtained locally. This will give them seniority in the Corps as Flying Officers, but they will not be entitled to receive pay as Flying Officers (Observers) before the date of qualification.

Whilst serving as observers on probation they will receive flying pay at 3s. a day.

* * *

The following extracts are taken from a letter found in the possession of a private in the 18th Reserve Division of the German Army. It indicates the severe moral effect which bomb dropping combined with long range artillery may have upon reserve regiments on their way up to the firing line before even they have reached the trenches:—

"Many times, long before a German battalion had arrived near the trenches, it was but a collection of nerve-broken men bemoaning losses already suffered far behind the lines and filled with hideous apprehension. For British long-range guns were hurling high-explosives into distant villages, barraging cross-roads, reaching out to railheads and ammunition dumps, while British aviators were on bombing flights over railway stations and rest-billets, and high roads down which the German troops came marching at Cambrai, Bapaume, in the valley between Irlès and Warlencourt, at Ligny-Thillois, Busigny, and many other places on the lines of route.

"German soldiers arriving at Cambrai by train found themselves under the fire of a single aeroplane which flew very low and dropped bombs. They exploded with heavy crashes, and one bomb hit the first carriage behind the engine, killing and wounding several men. A second bomb hit the station buildings, and there was a great clatter of broken glass, the rending of wood and the fall of bricks. All lights went out, and the German soldiers groped about in the darkness amidst the splinters of glass and the fallen bricks, searching for the wounded by the sound of their groans. It was but one scene along the way to that blood-bath through which they had to wade to the trenches of the Somme.

"Flights of British aeroplanes circled over the villages on the way. At Grevilliers, in August, eleven 112-16 bombs fell in the market square so that the centre of the village collapsed in a state of ruin, burying soldiers billeted there. Every day the British aviators paid these visits, meeting the Germans far up the

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roads on their way to the Somme, and swooping over them like a flying Death. Even on the march in open country the German soldiers tramping silently along—not singing in spite of orders—were bombed and shot at by these British aviators, who flew down very low, pouring out streams of machine-gun bullets. The Germans lost their nerve at such times, and scattered into the ditches, falling over each other, struck and cursed by their 'unteroffizieren,' and leaving their dead and wounded in the roadway.

"As the roads went nearer to the battlefields they were choked with the traffic of war, with artillery and transport wagons and horse ambulances, and always thousands of grey men marching up to the lines, or back from them, exhausted and broken after many days in the fires of hell up there.

"Above all the noise of this confusion and death in the night the hard, stern voices of German officers rang out, and German discipline prevailed and men marched on to greater perils."

* * *

The Secretary of the War Office announced that on Dec. 4th Major-General Sir S. B. von Donop, K.C.B., would vacate the post of Master-General of the Ordnance, and would be succeeded by Major-General W. T. Furse, C.B., D.S.O.

General Furse brings not only a fresh mind to bear on the problems with which the Department has to deal, but a ripe and varied experience both in peace and war. He is pre-eminently a gunner and a General Staff officer of proved ability. He has also the advantage of being young for his position, not yet having attained 52 years of age. Commissioned in 1884, he began his Staff service as Aide-de-Camp to Lord Roberts in 1891, when the late Field-Marshal was Commander-in-Chief in India. After graduating at the Staff College, he again served on Lord Roberts's Staff during the South African War as Assistant Adjutant-General for Transport, and was mentioned in dispatches and received the D.S.O. in recognition of his services. He subsequently served on Sir Evelyn Wood's Staff when that Field-Marshal commanded the Second Army Corps, relinquishing his appointment in order to take up the command of a battery.

Later, after a tour of duty on the General Staff at the War Office, he was selected for appointment to the Directing Staff of the Staff College, and was promoted Brevet Lieutenant-Colonel on appointment. Having completed the term of this appointment, the command of an artillery brigade filled up the interval till the outbreak of the war, since when his record is, from the point of view of the public, a sealed book, though a mention in dispatches discloses the fact that he has been serving on the Staff in the field on the Western front.

It is of interest to note that it was largely through his instrumentality that Kite Balloons came into use by the Artillery, and he was also one of the first officers of high rank to appreciate the possibilities of the contraptions now known as "Tanks."

It also deserves mention that he has been closely associated with the present Chief of the Imperial General Staff on several occasions at the War Office, at the front, and on the staff of the Staff College while Sir William Robertson was Commandant of that establishment. His intimacy with the First Military Member of the Army Council, coupled with his own varied experience in matters relating to the preparation for and conduct of war, augurs well for the harmonious co-operation of the two Departments in the best interests of our armies in the field.

General Furse is a brother of the Bishop of Pretoria, and also of the famous painter, C. W. Furse.

* * *

Major Lanoe George Hawker, V.C., D.S.O., R.E., attached R.F.C., who is reported missing, is a son of the late Lt. H. C. Hawker, R.N., of Home Croft, Longparish, Hants, and was born in 1890. He was educated at the Royal Naval College, Dartmouth, and the Royal Military Academy, Woolwich, and entered the Royal Engineers in 1911.

He joined the R.F.C. a few months before the war and was in the last pre-war course at the C.F.S., finishing his course there just before war broke out.

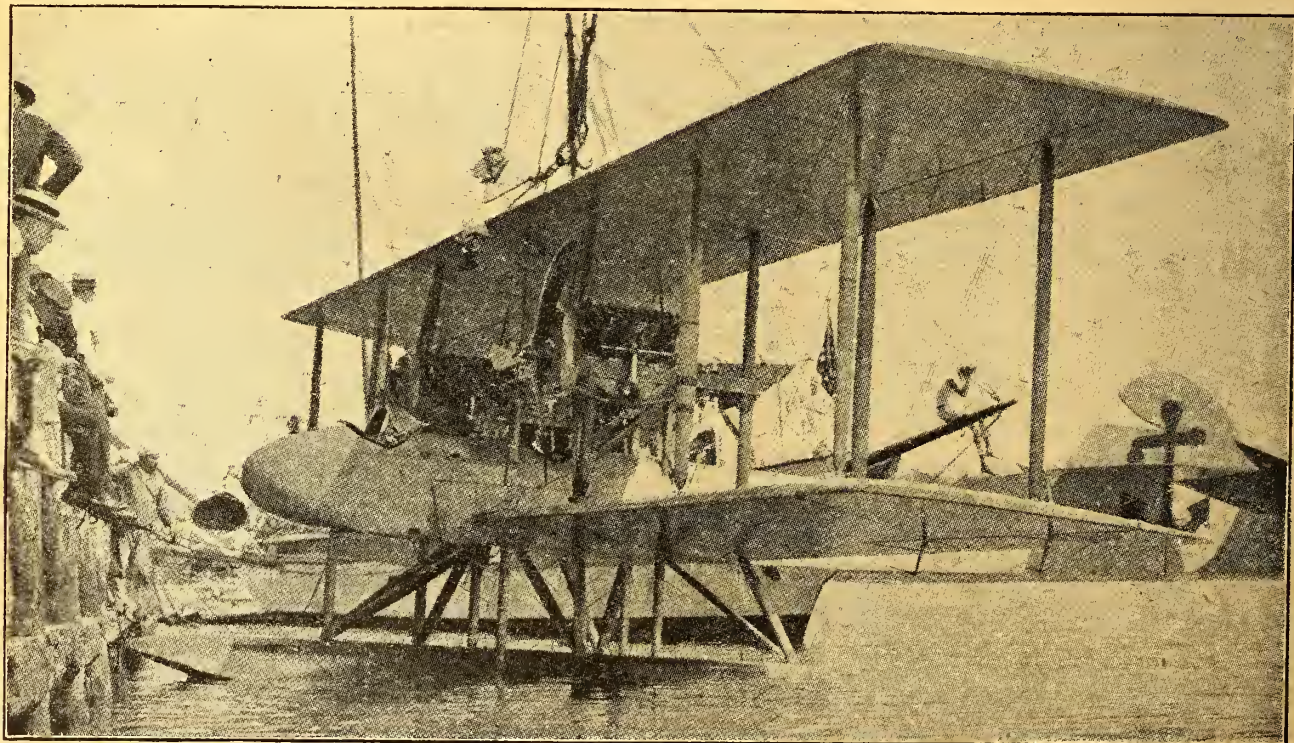
During the present war he has received mention in dispatches, as well as the D.S.O. and the V.C.

Major Hawker, then a captain, won the Victoria Cross on July 25th, 1915. The official record of his deed is as follows: "When flying alone he attacked three German aeroplanes in succession. The first managed eventually to escape, the second was driven to ground damaged, and the third, which he attacked at a height of about 10,000 feet, was driven to earth in our lines, the pilot and observer being killed. The personal bravery shown by this officer was of the very highest order, as the enemy's aircraft were armed with machine-guns, and all carried a passenger as well as the pilot."

The specific act which won the award was, in fact, the culmination of a long series of very gallant air fights, in which he was uniformly successful.

The D.S.O. was conferred upon Major (then Lt.) Hawker for an exploit of which the following is the official record: "For conspicuous gallantry on April 17th, 1915, when he succeeded in dropping bombs on the German airship at Gontrode from a height of only 200 ft. under circumstances of the greatest risk. Lt. Hawker displayed remarkable ingenuity in utilising an occupied German captive balloon to shield him from fire whilst manœuvring to drop the bombs."

Major Hawker was one of those who, like the late Major Waldron, believed that a squadron-commander should only hold his command if he flies enough to know from his own experience what he is asking his subordinates to do. Major Waldron lost his life in demonstrating his faith in his theory, but one hopes that a



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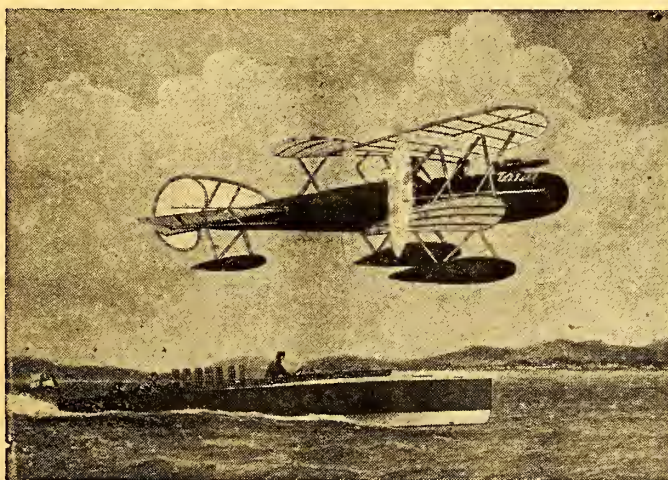
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better fate has befallen Major Hawker, and that he is, at worst, a prisoner in Germany.

* * *

THE CASUALTY LIST.

Reported Nov. 29th.

KILLED.—Colomb, Lt. G. L., London Regt. and R.F.C.

Haarer, Sec. Lt. P. McL., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Skinner, Capt. A., S. Lancashire Regt. and R.F.C.

WOUNDED.—Roberts, Sec. Lt. E. P., R. Sussex Regt. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND A PRISONER IN GERMAN HANDS.—Wood, Sec. Lt. R., W. Yorkshire Regt. and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Dingley, Sec. Lt., R. L., Worcs. Regt. and R.F.C.

Kennard, Sec. Lt. C., R.F.C.

Lawton, Lt. J. B., East Kent Regt. and R.F.C.

Middlebrook, Sec. Lt. N., Rifle Brigade and R.F.C.

Reported Nov. 30th.

WOUNDED.—Gilby, Sec. Lt. T. R., R. W. Kent Regt., attd. R.F.C.

MISSING.—Lees, Sec. Lt. J. C., R. Scots Fus. and R.F.C.

Reported Dec. 1st.

KILLED.—Laird, Sec. Lt. A. C., Black Watch and R.F.C.

WOUNDED.—Harrow-Bunn, Lt. A. L., Sherwood Foresters, attd. R.F.C.

Hazelton, Lt. W. E., W. Yorks. Regt., attd. R.F.C.

Maurice, Lt. A. P., A.S.C., attd. R.F.C.

Moller, Sec. Lt. F. S., R.F.C.

Watson, Capt. G. L., W. Yorks. Regt. and R.F.C.

Whelon, Sec. Lt. E. G., R. Sussex Regt. and R.F.C.

MISSING.—Begg, Sec. Lt. H. B., R.F.C.

Corbett, Lt. R., Yeomanry and R.F.C.

Hawker, Major L. G., V.C., D.S.O., R.E., attd. R.F.C.

Reported Dec. 2nd.

KILLED.—Hargreaves, Lt. N., E. Lancs R. and R.F.C.

WOUNDED.—Jones, Sec. Lt. B. H. M., R.F.C.

MISSING.—Blayney, Sec. Lt. B. W., R.F.C.

Reported Dec. 4th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—R.F.C.—Digby, 4043 2nd Cl. Air Mech. B. (Clapham, S.W.); Morton, 2173 Sgt. G. J. (Manchester).

Reported Dec. 5th.

WOUNDED.—George, Lieut. F. A., Northumberland Fus., attd. R.F.C.

MISSING.—Clark, Sec. Lieut. W. B., Yeomanry and R.F.C.

Hanning, Sec. Lieut. J. T., R.F.C.

Parker, Capt. G. A., Northampton Regt., attd. R.F.C.

Strause, Lieut. V. A., A.S.C., attd. R.F.C.

PERSONAL NOTICES.

DEATHS.

COLOMB.—Lt. George Lushington Colomb, London Regiment and R.F.C., was the second and only surviving child of Mrs. Maud Colomb and the late William R. Colomb, of Rossleigh, Greystones, County Wicklow.

He and his elder brother, Mervyn, were educated at Haileybury, and both enlisted in the London Regiment on the outbreak of the war. They fought as non-commissioned officers at Ypres and at Neuve Chapelle, where they were wounded. The elder brother, who had just received his commission, died of his wounds. Lt. George Colomb received the D.S.M. for his gallantry in rescuing wounded comrades, and his commission.

After serving some time with the depot at home, he joined the R.F.C., and had been five weeks at the front and had taken part in one successful engagement when his machine met with an accident which caused his death at the age of 29.

* * *

HALL.—Lt. Edward Henry Hall, Duke of Cornwall's Light Infantry, attached R.F.C., was killed in a flying accident at a Yorkshire aerodrome on Nov. 27th. He had ascended in a new machine and had only been in the air about two minutes when apparently he experienced engine trouble and the machine fell to earth from the height of about 100 ft. Mr. Hall was 24 years of age and was the eldest son of Mr. and Mrs. Percy H. Hall, of Caterham, Surrey.

* * *

HYNES.—Sec. Lt. Ernest Stanley Patrick Hynes, R.F.C., killed on Nov. 10th, aged 18, as the result of an accident while flying on duty, was the youngest son of Mr. H. H. Hynes and the late Mrs. Hynes, of Penmorvah, Penzance. He belonged to an Irish family from King's County, and was educated at Rosslyn House and Price's School, Fareham. He entered the R.F.C. through Sandhurst after being gazetted to the Buffs. He left for the front on Sept. 20th last.

His commanding officer writes:—"I can't say how sorry I am that such a splendid fellow should lose his life; everyone liked him immensely, and I looked upon him as the best of the younger pilots. His heart was in the right place and he was very keen and exceptionally promising."

KENNY.—Lt. J. M. J. Kenny, R.F.C. (killed in action on Sept. 23rd), was 20 years of age, and son of the late Patrick J. Kenny, solicitor, Waterford. He had a commission in the Army Service Corps in April, 1915, and, transferring to the R.F.C., was gazetted flying officer in the September following; he was promoted in May of this year.

* * *

LAIRD.—Sec. Lt. Andrew C. Laird, the Black Watch and R.F.C., killed, was the youngest son of Mr. and Mrs. John Laird, of Balmoral Place, Crosshill, Glasgow, and was 22 years of age. He joined the Glasgow Highlanders at the outbreak of war, received a commission in the Black Watch in June, 1915, and was transferred to the R.F.C. in August, 1916. Before the war he was employed by John Laird and Sons (Ltd.), wholesale stationers, Glasgow.

* * *

LILLYWHITE.—News has been received of the death of Capt. Robert John Lillywhite, R.F.C., in an aeroplane accident at the front, at the age of 23. Capt. Lillywhite was a nephew of Lillywhite, the famous Sussex cricketer, and his father was for many years in the service of the Duke of Richmond, on his West Sussex estate.

He originally entered the Navy, but was discharged for medical reasons. He joined the Grahame-White School at Hendon and was one of the first to obtain a pilot's certificate under the new rules. He did a great deal of exhibition and passenger carrying and was a most popular pilot. He enlisted on the outbreak of war as Flight-Sergeant-Instructor in the R.F.C., and served in Egypt. In 1915 he was transferred to another front, where he obtained a commission. Injured in a motor accident early in this year, he returned home to recuperate. During this period he carried out duties as inspector of aerodromes and lecturer. In September he was promoted to captain.

* * *

LUCAS.—In the War Office list of Nov. 12th Capt. Lord Lucas and Dingwall was posted as missing, but news having now been received that he is killed, a friend sends the following tribute, which was published in the "Morning Post":—

In Bron Lucas there has passed out of sight a figure of altogether exceptional charm and power. From the days when as an undergraduate he rowed in the Oxford Eight to the day when he turned to face an enemy aeroplane, and so fighting met the end he would have desired, he inspired among his friends an intense devotion. The beginning of the war found him a member of the Ministry and tied to Parliament.

The formation of the Coalition Government gave him the opportunity he wished for. Shaking the dust of politics from his feet he rushed to the war with the eagerness of a boy, and choosing the shortest and most adventurous way, joined the Flying Corps, quickly establishing for himself a name as a skilful and successful pilot.

Offered a squadron, after service in Egypt, he resolutely refused promotion till he had flown over the German lines, and gained experience of the conditions prevailing at the front.

War was no new adventure for him. In the South African campaign he had been already wounded, and lost a leg. To most men the loss of a limb might reasonably act as a discouragement and hindrance, but to Lucas it seemed an incentive to enterprise. The standard he set himself was not the standard of a man so handicapped, but that of a man completely sound. Whatever was possible by way of effort or hazard to the whole in limb was to be equally possible to him. He ignored the defect, and so ignoring, triumphed. That was of a piece with his character, with the buoyancy of his temperament, and the lifting power of his enthusiasm. Never did he allow this difficulty to come between him and efficiency.

It was by such determination that he achieved success in the air. Entirely without fear, danger affected him like wine or bracing winds. He was essentially a fighter, set on soldiering from the earliest days, and finding his opportunity in the full tide of his career.

The lines written by a kindred spirit, the object of one of his most devoted friendships, are singularly applicable:—

The fighting man shall from the sun

Take warmth, and life from the glowing earth

And find when fighting shall be done

Great rest and fullness after death.

He was a born lover of Nature. The things of the forest and the sea, the changes of sunshine and cloud, the open road, the life of birds, the winds upon the downs and moors had for him their supreme appeal. He was never happier than in long tramps which found him each evening at a new stage in a cross-country journey.

His powers of observation were unusually keen, his appreciation intense, and on such an excursion both would be in full and enchanting use. But in all conditions he was an unrivalled companion. The beauty and distinction of his person, the energy and humour of his speech, the burning sincerity of his character, the range of his interests, made a combination difficult to match.

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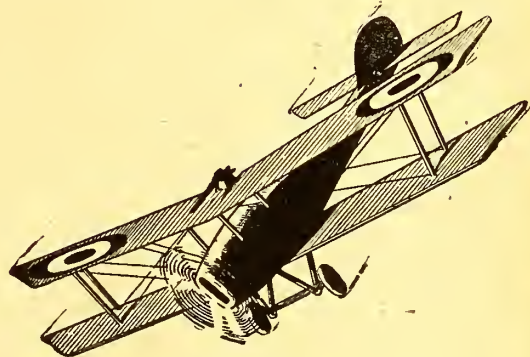
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pose, he held an attitude of happy, if intrepid, and sometimes fierce, intolerance: conventions, conormities to unessentials, were to him as sawdust to the mouth, and with an instinctive measure for values he was by disposition on the side of the things which count. The boy in him was alive to his latest day. Whether pony hunting in the New Forest or caged in an office, there was about him the sunshine of youth; in all he did there was still the first, fine, careless rapture.

Inheritor of great possessions, he sought only to use them to the public advantage. He had converted Wrest, his country house in Bedfordshire, into a hospital, and offered it to the nation as a centre for disabled soldiers after the war. To the last he was busy with schemes for improving the lot of the country labourer: enlightened generosity was, indeed, a second nature to him. He was of the type which can least be spared, for he embodied and set forth all that is best in the spirit of the country. His was the essence of the English character at its highest.

Those who were his friends know that something has gone which is not to be replaced in their own lives, something, moreover, which is not easily to be made good in the life of the nation.

Capt. Lord Lucas, Hampshire Yeomanry and R.F.C., was born in 1876, the son of the Hon. Auberon Herbert (a younger son of the third Earl of Carnarvon) by his marriage with the sister of the seventh and last Earl Cowper, who also held, among other titles, the baronies of Lucas and Dingwall. He succeeded to these baronies on his uncle's death in 1905.

Educated at Bedford Grammar School and Balliol, Lord Lucas rowed 7 in the Oxford boat in 1898 and 1899. During the South African War, in which he was acting as a correspondent of the "Times," he was wounded, and his leg had to be amputated.

After a year as private secretary to the Secretary for War, he was appointed Under-Secretary at the War Office in 1908; from this post he passed in 1911 to the Under-Secretaryship for the Colonies; and later in the same year became Parliamentary Secretary to the Board of Agriculture. He was keenly interested in agriculture and a great Nature-lover. In 1914 he entered the Cabinet as President of the Board of Agriculture, and held this office until the formation of the Coalition in May of last year, when he was one of the Ministers who retired.

He at once gave up political work and joined the R.F.C., though he was many years over the standard age for this arm. Proving a skilful pilot, he soon gained his certificate and went out to Egypt, where he saw a good deal of service. On his return to England he was engaged for some months in instructing recruits for the Flying Corps.

A few months ago, while he was coaching a pilot, his machine dived and the pilot was killed, but Lord Lucas escaped. He was offered the command of a squadron but refused promotion until he had gained experience on the Western front. He had only recently gone out to France.

He was unmarried, and the Lucas and Dingwall baronies pass by special remainder to his only sister the Hon. Nan Ino Herbert, who was born in 1880. The second heiress is Lady Desborough, who is also co-heiress with her and the children of Admiral of the Fleet Lord Walter Kerr to the barony of Butler.

ENGAGEMENT.

NEAL—COUCHMAN.—An engagement is announced between Sec. Lt. Austin E. Neal, R.F.C., son of the late Mr. Thomas Neal, of Spondon, Derby, and Millicent Gertrude, only daughter of Mr. H. A. Couchman, Shobnall Grange, Burton-on-Trent.

MARRIAGES.

ROCKINGHAM GILL—COURT TREATT.—On Dec. 2nd, 1916, Lt. Rockingham Gill, R.G.A. and R.F.C., elder son of Mr. and Mrs. Rockingham Gill, was married to Christina Dolores, daughter of Mr. and Mrs. R. Court Treatt, of 6, Nevern Road, S.W., at St. Cuthbert's Church, Philbeach Gardens, by the Rev. H. Westall, Vicar, assisted by the Rev. W. J. Barton.

* * *

RABAGLIATI—PRIESTLEY.—On Nov. 26th Capt. (temp. Major) Cuthbert Euan Charles Rabagliati, M.C., R.F.C., youngest son of Dr. and Mrs. Rabagliati, of Whinbrae, Ben Rhyddi, Yorks, was married to Monica, only daughter of Mr. and Mrs. J. C. Priestley, of Tatmore Place, Hitchin, at St. Ippolyt's Church, Hitchin, Herts, by the Rev. H. R. Foster, M.A., Vicar.

* * *

THORNE—HILLMAN.—On Nov. 27th Capt. Guy Strafford Thorne, R.F.C., was married to Gwendoline Charlotte, only daughter of Comdr. (R.N.) and Mrs. Hillman at St. Ninian's Church, Invergordon.

BIRTH.

BELL-IRVING.—On Nov. 30th, at 7, Brodrick Avenue, Alverstoke, Hants, the wife of Capt. Richard Bell-Irving, R.F.C.—a son.

AIR BOARD REPORTS

The following extracts from communiqués received from the R.F.C. in France were issued by the Air Board on Dec. 4th:—

Oct. 28th.—Two of our machines were attacked by six enemy

machines, who were almost immediately joined by six more. At the end of five minutes' strenuous fighting two of the German machines came into collision. The fight continued for about 15 minutes, when all the enemy machines withdrew and ours returned undamaged.

It seems probable that this is the fight in which Capt. Bölske was killed, as he was reported in the German wireless news to have been killed as the result of a collision in the air on that date.

Nov. 9th.—A bright, clear day resulted in unusual activity on the part of the enemy's aircraft. His aeroplanes actively co-operated with his artillery. On several occasions our artillery and photographic machines were molested, and our bombing expeditions, reconnaissances, and patrols were constantly engaged throughout the day while over the enemy's country.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Nov. 30th.—It is confirmed that on Nov. 23rd, at 1 o'clock in the afternoon, Sous-Lt. Nungesser brought down his 18th aeroplane. The enemy machine was dashed to pieces on the ground near Falvy, in the Somme region.

ARMY OF THE ORIENT.—Our aircraft dropped many bombs on Prilep.

DEC. 1st.—The factories of Thionville (north of Metz) and some bivouacs in the region of Damvillers (north of Verdun) were bombed yesterday evening by our aircraft.

ARMY OF THE ORIENT.—Prilep has been bombed by our aeroplanes.

DEC. 2nd.—Last night one of our aeroplanes dropped nine bombs of 120 mm. on the railway station of Spincourt (north-east of Verdun), and three of the same calibre on enemy cantonments at Billy-sur-Mangiennes (west of Spincourt).

DEC. 3rd.—Between 5.30 and 10 o'clock on the night of Dec. 2nd-3rd seven aeroplanes dropped 720 kilogrammes (about three-quarters of a ton) of projectiles on the factories of Thionville (north of Metz), and on the enemy's aviation hangars and cantonments at Eton (north-east of Verdun).

* * *

A report from Chicago states that the American Escadrille took part in the recent raid on Oberndorf.

Lt. de Lagage and Adjutants Norman Prince, of Chicago and Boston, Raoul Lufbery, of New Haven, and Didier Masson, were members of the escort of fighting pilots guarding the fleet of 65 French and British bomb-dropping aeroplanes which flew into Germany and bombed the Mauser munition factories at Oberndorf.

The aeroplanes started from three aerodromes back of the French lines in the Alsace region. The first, rising 15 minutes before the time scheduled for the other two, flew over the German lines, and created a diversion by drawing to that point most of the German guarding machines.

Then the main fleets rose, and flew almost unopposed nearly 100 miles, and threw 15,000 pounds of the high explosives on the Mauser plant.

The first bombarding machines to arrive at Oberndorf blew down the main building of the ammunition works, covering more ground than an American city square. The aeroplanes arriving later had only to drop bombs into the flames and smoke that obstructed the view of the factories.

Meanwhile, German aeroplanes were hastening to the conflict, and on the return trip of the raiding machines into France scores of hard-fought air battles occurred.

Lufbery shot the pilot of an Aviatik, whose machine plunged to the earth. Masson, when directly over the Rhine, destroyed a German machine, which fell into the river.

Darkness began to fall as the machines neared the French lines. Prince, already wounded, was attacked by a Fokker, but one of Prince's bullets found a vital part of the Teuton's machine, and the Fokker fell earthward in flames.

Only five of the French machines in the raid failed to return, while the German communiqués admit the loss of eight fighting aeroplanes. Damage to the extent of many millions of dollars was done to the Mauser works.

GERMANY.

OFFICIAL COMMUNIQUÉS.

Nov. 28th.—On the night of Nov. 27th-28th several airships successfully bombed blast furnaces and industrial establishments in Central England. At several places conflagrations were observed.

The defence was extraordinarily powerful. One airship fell to hostile anti-aircraft and came down near Scarborough. A second airship has not returned, and she must be considered lost.

The other airships have returned and have landed.—CHIEF OF THE ADMIRALTY STAFF.

DEC. 4th.—FRONT OF FIELD-MARSHAL VON MACKENSEN.—Cavalry and aviators succeeded in interrupting the railway communications in the rear of the Roumanian Army.

* * *

A telegram from Berlin through Amsterdam, dated Dec. 1st,

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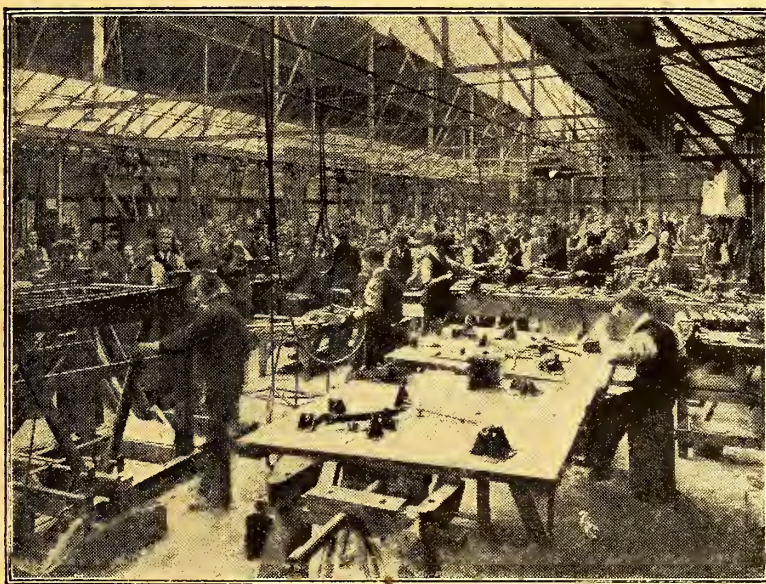
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FITTING SHOP.

AERODROME & SEAPLANE FLYING STATION: COBNOR, near CHICHESTER.

states:—One of our submarines recently came across a damaged British aeroplane off the mouth of the Thames. The occupants of the machine, two British officers, were taken prisoners, and the aeroplane destroyed.

It is reported by the "Daily Express" correspondent at Geneva, a gentleman who sometimes comes very near accuracy in his reports on Friedrichshafen affairs, that the destruction of two more Zeppelins, making a total of four in November, has caused consternation in Southern Germany, especially at Friedrichshafen, whence the majority of the experts in the crews are drawn. The opinion is growing that Zeppelins are useless as an offensive force.

The local authorities at Friedrichshafen have issued a bombastic report stating that eleven airships participated in a raid on the principal fortified towns and ammunition factory centres of England with great success. They admit that two Zeppelins did not return. The report, which is meant to reassure the workers, adds: "This is our fortieth successful aerial attack against our principal enemy."

According to one German estimate the latest Zeppelins cost £264,000 each.

ITALY.

OFFICIAL COMMUNIQUÉS.

Nov. 30th.—Hostile aircraft attempted to raid several localities in the theatre of operations, but no damage or casualties are reported. Numerous air fights took place, which ended in the enemy aeroplanes being driven off, and two were shot down in the Agno valley and near Castel Nuovo in the Sugana valley.

Dec. 1st.—Hostile aircraft made raids on several points in the theatre of operations, but were driven off by the anti-aircraft guns and fighters. Enemy aeroplanes dropped bombs on Grigno, in the Sugana valley, without doing any damage.

One of our air squadrons dropped numerous bombs on the station of Volano, north of Rovereto, causing damage and fires.

Another squadron dropped bombs on the station of Rifemberg (Reifenberg), in the Branizza valley. Some trains standing were hit. All our aeroplanes returned in safety.

Dec. 2nd.—Enemy aircraft dropped bombs on Vicenza, without causing casualties, but doing some damage to the church of St. Corona.

Dec. 3rd.—Our aeroplanes bombed enemy billets at Dorimbergo (Dornberg) and Tabor, in the Frigido (Vippacco) Valley. All our machines returned safely.

Dec. 4th.—One of our air squadrons yesterday bombed the railway station for Dottoglian and Scoppo (Skopo), on the Carso (7½ miles north-east of Trieste). Notwithstanding bad weather conditions and the violent fire of the enemy artillery, our aviators came down low to drop a ton and a half of high explosive on the targets. Numerous air fights took place, and one enemy machine was brought down; one of ours is still missing.

Hostile seaplanes dropped bombs at several points on the Carso, without causing casualties or damage. As a reprisal, an aeroplane dropped five large bombs on the floating hangars at Trieste, with excellent results.

SERBIA.

OFFICIAL COMMUNIQUE

Nov. 29th.—Our aviators bombarded objects of military importance at Prilep.

ROUMANIA.

OFFICIAL COMMUNIQUÉ.

Nov. 23rd.—Referring to "a letter sent by the Pope to the Queen, the newspaper "Universal" observes that the head of Catholic Christendom, who counts millions of Germans and Austrians among his spiritual subjects, brands as criminals the aviators who are bombarding the Roumanian capital.

The town of Rymnik Sarat, which is far behind the fighting line in eastern Roumania, is the latest place to suffer from the bombs of enemy aviators.

Some days since the enemy aviators after attacking the western part of Bukarest returned before noon, having been joined by several others arriving from the direction of Tchernavoda. They maintained an almost continuous bombardment of the city for several hours. The aeroplanes, it is stated, were 11 in number.

It is reported from Kieff via Petrograd that enemy aviators are mercilessly dropping bombs, and machine-gun firing on refugees on all roads from Western Roumania.

BULGARIA.

OFFICIAL COMMUNIQUÉS.

Nov. 29th.—An enemy aeroplane dropped two bombs on the village of Radolivo.

Dec. 2nd.—Two enemy seaplanes, flying from the Island of Thasos towards Porte Lagos, were received by our artillery and machine-gun fire. At the same time two German seaplanes bore down upon them. One of the enemy seaplanes was brought down on land and the other into the sea. We made prisoners the four aviators, one of whom was wounded.

HOLLAND.

It was reported that a German seaplane which had lost its way owing to fog came down on Nov. 30th at Oterdun, in the province of Groningen. After receiving directions from Dutch soldiers it ascended again and flew off in the direction of Borkum.

U.S.A.

Silas Christofferson, consulting engineer of the Christofferson Aircraft Manufacturing Company, and one of the best known of American pilot-constructors, was killed on Oct. 31st, when his machine overturned in a fall of 100 feet during a trial flight of a new military aeroplane. Christofferson was flying at a height of several hundred feet when his engine stopped. He glided to an approximate height of 100 feet, but seemed to lose control, and plunged to earth, the machine turning over upon him.

His wife and two brothers were watching the flight, and rushed to his aid, with Miss Eugenie Doty of San Francisco, an aviation pupil. The injured aviator was hurried to a hospital, but expired soon after reaching there. Christofferson took up aviation in 1910. His most noted flight was several years ago, between San Francisco and Los Angeles, over the Tehachapi mountains.

It is reported that Mr. Glenn H. Curtiss has recently been granted important patents covering the construction of hydro-aeroplanes. The patents cover an extremely wide field, and apparently control all water machines using a central float or body with a hydroplane bottom. The machine described in the specification is one of the old-type Curtiss pusher waterplanes with a single non-stepped float, and with balancing floats at each wing-tip, but the alternative schemes include every kind of apparatus capable of flying with wings, and fitted with a float capable of travelling on top of the water as a hydroplane.

FROM DENMARK.

The following has been received from THE AEROPLANE's Danish correspondent:—

From and between the lines of various German newspapers the following information can be extracted.

Two aircraft works of newer date which advertise regular for skilled works and have turned out no types of their own, so far as one knows, are the Merkur Flugzeugwerke and the Commandit Co. Richard Goetze. The latter firm runs four works. Nos. 1 and 2 are situated in Treptow, Elsenstreet 106-7, No. 3 is at Berlin, Schlessischestreet 26, and work No. 4 finally at the Johannisthal aerodrome, entrance 6. It appears from the papers that the Goetze Co. turn out Otto biplanes.

A firm by name of J. T. Grueber make it known that they supply spiral springs to replace the former standard rubber springs.

"Flugmaschine Rex Gesellschaft" at Ossendorf by Cologne, the moving spirit of which is Dr. Hansen, formerly of the Statax Co., London, now advertise a Rex single-valve rotary engine.

The income of the "Liepziger Luftschiffhafen und Flugplatz Gesellschaft" (Airship shed and Aerodrome) for last year amounted to 33,647 marks beside the subsidy of 21,633 marks.

The Germania Flugzeugwerke at the above aerodrome, as well as the "Weimarische Fliegerschule" at Weimar, the "Germanisches Pilot Academie" at Lossburg, Rodt, in Wurthembourg, and the "Centrale fur Aviatik" at Johannisthal, all cater for civil pupils now again, so that the Army authorities apparently reckon with this additional source of pilot supply, apparently from the young men not yet of age for the Army, and who have money to learn to fly, thus preferring the air fighting to the trench battles.

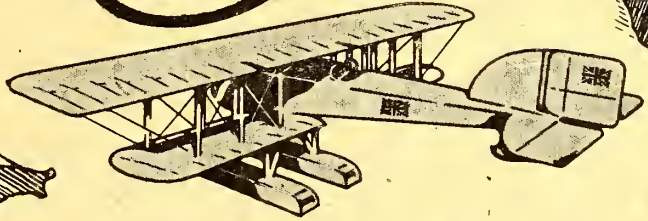
One notices a new name of aircraft manufacturers in the Hungarian "Allgemeine Maschinen Aktien Gesellschaft" aeroplane department at Budapest, Vaczi-ut 141/43. And the Budapest Grossbank has floated a new aero-engine works with a capital of several million marks, sites having been leased for 50 years in Komitat Somogy on the Platten See, which position likely indicates seaplane manufacture being contemplated, too.

The Luftfahrarsenal in Vienna has formed a Luftfahrban training section, inviting youngsters between 14 years and 17 years of age to join on six years' contracts, training them as turners, splicers, welders, fabric hands. After the lapse of the six years the men can either continue in the Air Service or enter the aircraft trade, as they like.

Böelcke, Immelmann and Buddicke having had their fights—and deaths, too—on the Fokker monoplane, the mount of the new breed is by preference the single-seater Halberstadt fighting biplanes, turned out by the former German Bristol Works, having now taken their name from their situation. The biplane has a fuselage on Morane-Fokker outlines with an enlarged rudder, a huge nose telling the presence of a high-powered Mercedes or Benz engine, likely of 220-h.p., and staggered planes. As the accompanying picture illustrates the number of struts seems very important to the German mind.—[See page 1080. Ed.]



Sage



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E. C. GORDON ENGLAND, A.F.Ae.S.
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REAL NAVAL WORK.

It is always more pleasing to write appreciatively of anybody or anything than to be for ever criticising, though unhappily the need for reforms, and the hope of helping to produce efficiency, makes it necessary to spend so much time in criticising as to leave little time or space for appreciation. Moreover, owing to the war one is naturally debarred from describing anything really good when such a description might be of value to the enemy, which rather cramps one's appreciatory style. However, perhaps one may venture to record certain very favourable impressions received recently in the course of a visit to a certain seaplane station which must be officially nameless. Of course every Naval Hun knows of its existence, and thousands of neutral "schippers" see its machines in the air and on the water day after day, but it would never do to let the British Public hear of its whereabouts.

However, it has been made known in the Press that a number of members of both Houses of Parliament, alleged to be 70 or 80 in number, but actually totalling some 55 bodies—to say nothing of souls, seeing that so many were M.Ps.—were permitted by the Naval authorities to go and see for themselves our aerial progress, and though journalists were not part of the official party, I, the present writer, went with them, as a kind of moral stowaway. As, however, the officer commanding that station happened to be a very old friend of mine, and as a still higher officer in Whitehall had raised no objection to my visit, there was little enough concealment so far as the R.N.A.S. was concerned.

It so happened that I had not seen this station since some months before the war, when it consisted of three or four beautifully kept sheds grouped round a concreted yard, whence a solitary slipway ran to low-water mark. It was a splendidly run station then, and it has been fortunate in having a succession of C.Os. who have kept up its standard despite its enormous growth.

As we approached the station by water the multiplication of slipways made it look like a ship-building yard more than a mere seaplane station, and I found it difficult to identify the original sheds among the young town of futuristically painted steel and corrugated iron buildings which have sprung up all round it. In fact, when they were identified they looked more like petrol stores than anything else, alongside the huge edifices which now house His Majesty's Seaplanes.

The visitors were, naturally, hugely impressed by the display of aircraft, both in and out of the sheds. The Peers peered diligently into all the machines, and the ordinary members evidently tried to remember for future reference all that was told them, by the affable young officers who showed them round, about the size, weight, speed, climb, and general capability of the various seaplanes.

Lord and Commons alike "took the air" in quantities. I dare not say how many went up at a time in one machine of a certain type, but the temporary crew went in and came out in a regular procession, which must have reminded them of a division in the House, barring that they were all voting one way—namely, that in this direction at any rate the R.N.A.S. is making remarkable progress.

There happened to be about, on the water and in the air, certain seaplanes of similar, but much earlier, type, which in their day were regarded as colossal. In fact, some people regarded them at the time as being about the limit in seaplane size. But alongside their successors they looked like dingies alongside a decent-sized yacht.

More than that one cannot say in print, though to one who has always believed in big seaplanes it is a strain on one's self-command to have to refrain from saying much more about the really gratifying results obtained on actual test by some of these new machines.

One can, at least, state that they are hardly beaten in speed and climb and weight-lifting capacity by the best of the big land-going machines, and that their behaviour on the water is extraordinary. They get off from dead smooth water with an unexpectedly short run and they alight—when decently piloted—with rather less fuss than a duck. Even when pushed into the water nose first by the hands of an inexperienced pilot they come out again quite happily, with perhaps something of a jolt, but without other ill effect. Also, I am assured by pilots in whose ability and truthfulness I have implicit trust that they behave exceedingly well in even a heavy sea.

At present several of these types are admittedly experimental, but even so they seem to me of greater war value than many of the seaplanes which have been used, or which the R.N.A.S. has attempted to use, on active service. With very little further improvement, chiefly in the direction of engine-power for weight, they will become first-class weapons of war.

The officer commanding the station must have a fairly arduous job, for not only has he to oversee the training of multitudes of young pilots in the art of flying seaplanes, and to instil a proper sense of Naval discipline into new drafts of officers and men

alike, but he seems to be also chief designer and experimental officer for the new types of seaplanes.

In all these tasks he seems to be remarkably successful. As we neared the stage a small scout seaplane manoeuvred with acrobatic skill over the grave and reverend legislators, and as we left a whole series of the big aircraft flew round and about in all directions, displaying excellently the ease with which they can manoeuvre, and their widely variable range of speed, so that one had good opportunities of judging the ability of the new generation of pilots.

The station itself is run like a clock. Everything is done "at the double," and the men are remarkably smart and well disciplined, reflecting the greatest credit on the disciplinary officers of the station.

As to the big seaplanes, I have already said as much as I dare about their size and performance, but I may perhaps add that the amount of development work accomplished in the past two years is quite unexpectedly great, and that thanks to the work done at this station, we are not only acquiring war machines of high value, but we are being rapidly brought nearer to the real transmarine liner of the future. My compliments to all who have had a hand in the good work.

After inspecting the seaplane station the nation's representatives were very hospitably entertained at lunch by the chairman of the railway which had brought them thither, and thereafter we visited various seagoing ships, including submarines, and sundry of the extremest "hush-hush" type, all very interesting and encouraging, for one saw that the country has the right stuff, on, under, and over the sea for the discomfiture of the Hun—if only it is properly used by those who stay at home and direct (or otherwise) its use.—C. G. G.

A PUPIL'S FIRST IMPRESSIONS.

The following extracts from a letter written to his people by a pupil at the Beatty School are at once instructive and amusing. As the extracts have been sent by the pupil's parent, Mr. Beatty must acquit the said pupil—if he recognises him—of being a journalist in disguise:—

Nov., 1916.

"As I rode through the factory gates I could hardly believe I was off to Hendon to learn to fly at last.

"Mr. Beatty was pleased to see me, but says he cannot guarantee anyone their ticket, either military or civilian, because there are so many people who can never learn and are absolutely hopeless.

"I did my first bit of rolling practice this morning (Date cautiously deleted). I must say some chaps are thick, and Mr. Beatty's words are confirmed. It is frightfully difficult to keep the 'bus straight—a Caudron with a 35-h.p. Anzani, which is quite powerful enough for first time.

"It took the first chap 15 minutes to cross the aerodrome and 10 minutes back, he found it difficult to keep straight. The majority of chaps make this course . . .

[Zig-zag lines are indicated here].

"Another chap did this—[A series of horizontal "loops" on the ground are shown in the letter]—so Mr. Beatty asked him if he would like a band to dance to. They gave him up as a bad job.

"Then my turn. What a thrill ran down my back as I crawled into the cockpit! It was hard to make myself realise that I was in the right place at last, at the joy-stick. As the chap swung the prop, 'Contact,' he said, but she didn't start. 'Off' was the next command. 'Off,' I said. You see, the pilot always repeats the prop-swingers word to prevent accidents.

"Well, after a few turns, I found we were starting her on full air. I closed this, off she started, then I got the mixture right. I very soon found out that unless you kept going, you couldn't do a thing, so I let her go, pushed the joy-stick forward to get the tail up; then, with a slight movement of the rudder-bar, she answered beautifully. I got there and back in 6 minutes. The instructor was bucked in a way, but I had put the wind up him, because if I had pulled the joy-stick back she would have gone up, when I would have got the wind up.

"Then I had another go. Let her go just the same. I wasn't afraid of the speed. It comes to this, you must put plenty of draught across your tail plane; unless you do, the 'bus has control of you. To do this you must get up speed, when your rudder will have something to act against. Also keep your tail up so she can swing about on her wheels.

"If you want to turn round, up with your tail, a smart kick at the rudder brings her round in a small radius. I learnt quite a lot this morning. I did two more straights, and the instructor told me I was all right. Then the wind sprang up, then it rained, which crowned everything, but do you know, I could have hugged the aeroplane when I finished?"

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THE INVASIONS OF ENGLAND.

On the night of Nov. 27th and in the early hours of Nov. 28th the airship raid on the East and North Eastern Coasts, briefly referred to in the official communiqués printed in *THE AEROPLANE* last week, took place with a pyrotechnic display which is becoming almost a habit.

As narrated in the official account, one airship attacked the Durham district and was brought down in flames in the sea. The German version says it sank off Scarborough. The airship arrived over a certain town about midnight, where she was picked up by numerous searchlights which circumvented the utmost endeavours of the airship to dodge them, although apparently extremely skilful manoeuvres were carried out by the crew of the airship with this intention. Fire was opened by anti-aircraft guns which ceased operations on the arrival of aircraft, which speedily set the airship on fire, causing it to fall seawards, where it sunk a mile from shore in 40 fathoms of water. It is reported that the airship broke into two sections during its fall.

Eighteen bombs were dropped in the district; six falling in a town, two in a park, and the rest in open country. One woman died from shock and eight people were injured, two seriously. As usual, the anti-aircraft people in the district were confident that they hit the airship. Bombs were dropped in the neighbourhood of a village, but the damage appears to have been slight. One unexploded bomb weighing 125 lbs. was found in the open country.

Another airship visited an East Coast town considerably lower down the map in the small hours of the morning of Nov. 28th. The airship was apparently travelling slowly and seemed more or less crippled, as if it had already been damaged by anti-aircraft guns or aeroplanes. No bombs were dropped. The local guns opened fire as the airship passed overhead but she carried on out to sea and got out of range. Aeroplanes pursued the vessel seawards and were lost in the mist, but they were successful in reaching their objective and in a short time the airship could be seen falling blazing into the water about nine miles from the shore.

This airship had dropped bombs in various places in the North-Midland counties earlier in the morning and appears to have had a very bad time before her final conflagration. It seems apparent from her long sojourn of five hours over England that something serious had happened to her working arrangements and that extensive repairs were made in the airship before the final attempt was made to get out to sea. It also appears as if something serious had happened to the aeroplane defences if it took five hours to find her after her initial mishap.

* * *

It is satisfactory to note that the R.N.A.S. and the R.F.C. share the honours as regards the latest "bag" and to note that the R.F.C. do not consider a Zeppelin which has been damaged by them to be their "bird."

* * *

Considerable annoyance has been caused to the enthusiastic members of a northern football club by the explosion of a large bomb in the middle of their field, but they console themselves by telling each other "the Boches never did understand sport as we do."

* * *

The official announcement of the destruction of the airships was read by Mr. Justice Shearman in the Divorce Court on Nov. 28th. The listeners applauded with enthusiasm. The announcement was similarly made in the Court of Appeal where the Master of the Rolls and Lord Justices Warrington and Scrutton were sitting. Lord Justice Scrutton suggested that perhaps the court would like to sing "God Save the King."

These demonstrations, patriotic though they may be, seem a trifle incompatible with the dignity of a British Court of Law and would seem to detract from the business in hand. But no doubt in times like these precedence must be given to popular enthusiasm.

Shortly before noon on Nov. 28th a German aeroplane which had apparently evaded all observation by flying inland at a great altitude, flew over London and dropped half a dozen small bombs in a fairly confined area. The damage done was slight and nine people were injured, most of the wounds being superficial. A small chimney-stack was blown down and a bomb fell straight through a dwelling house. Another bomb fell in the centre of a back street, and another inside a stable. In view of the height from which the bombs were dropped they must have been let fall almost at random, and even if they were aimed at any particular objective it is not surprising that the pilot did not strike a bull's-eye.

The excitement created by the raid was of the mildest possible character, chiefly because it was not at first realised by many people in the immediate vicinity that the explosion was anything more serious than back-firing cars or incidents of a similar nature.

The aviators got away from England, but as a German aeroplane was captured at Dunkirk later in the day containing two naval officers with a large scale map of London, it seems possible that the machine in question was the raider from London.

It is earnestly to be hoped that the authorities will take warning from this demonstration, which seems almost an action of charity on the part of the Germans to indicate what may be done, on a larger scale, unless it was intended as a bombastic set off against the recent French raids on Essen and Munich.

It seems probable that it was regarded as an experiment to check the nature of aeroplane patrols in England during the hours of daylight and to see whether a large squadron of aeroplanes might be launched against London with any reasonable prospect of success and with a warrantable number of losses. The autho-

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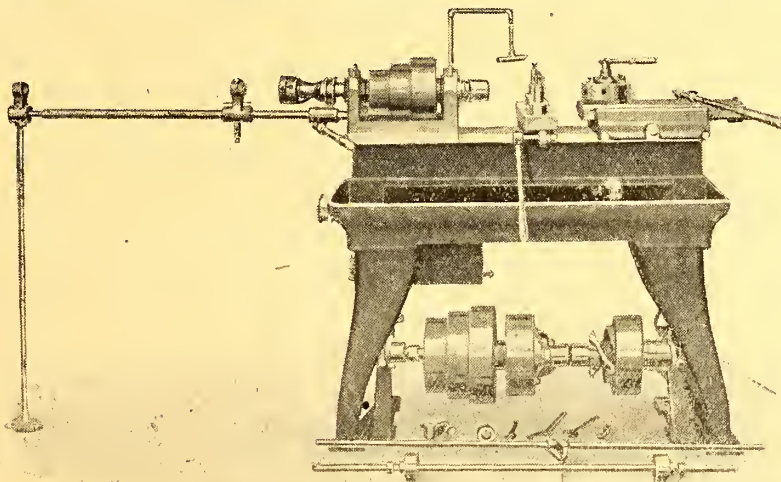
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

ities should consider this point and not only inwardly digest it but take action if necessary.

* * *

At a north-eastern town on Nov. 28th a man who was alleged to be drunk was sentenced to 21 days' imprisonment for striking matches in the street while a Zeppelin was in the vicinity.

Of course regulations must be enforced, but the magistrate's assertion that the man had endangered the lives of thousands of people seems a trifle exaggerated, especially when it is noted that another man was let off with a fine of £2 for a similar offence.

* * *

It is reported by the "Pall Mall Gazette" of Nov. 29th that the German aviator who bombed London was Master-Pilot Carl Meyer. His companion was a naval officer. It is not immediately apparent how the "Pall Mall Gazette" obtained this information.

* * *

The crew of a trawler, which entered a north-eastern port on Nov. 29th, reported that they saw a third Zeppelin, under fire, which seemed to be in difficulties.

* * *

In a reply to a letter from the Southwark Borough Council Major-General Sir Francis Lloyd states that all possible steps are being taken for protecting life and property in London on occasions of attack by hostile aircraft, and only such lights are permitted on railways and tramways as are absolutely necessary to ensure the continuance of traffic which is of the greatest national importance. The letter adds that observation has shown that sparking from electric trains and trams tends rather to confuse than to assist hostile aircraft in finding their way over London, and that it is not considered desirable to issue public warnings of impending air raids or to notify the public when the danger is past.

* * *

A report from Rotterdam on Nov. 30th states that the two airships destroyed in the last attack on England on the night of Nov. 27th-28th were commanded respectively by Lt.-Comdr. Max Diederich, of the Naval Reserve, and Naval Lt. Frankenberg, both of whom are described as specially meritorious and capable officers.

Diederich, who was formerly in the service of the Norddeutscher-Lloyd, earned fame and popularity in the early days of the war by bringing back to Germany the steamship "Brandenberg," which was lying at Baltimore at the time of the outbreak of hostilities. According to accounts published in Germany, Diederich evaded two British cruisers which were watching off the harbour, and, although the speed of his steamer was only twelve knots, managed to navigate it through the blockading force by the north of Scotland route to a home port.

* * *

An appeal signed by a considerable number of business firms in the City of London has been presented to the Lord Mayor, asking him to preside at a meeting at the Mansion House to consider a resolution dealing with the incidence of losses caused by enemy aircraft. The proposed resolution urges the Government to "abandon the insurance scheme and agree to compensate sufferers out of national funds."

* * *

At an inquest at a North-East town on Dec. 1st on the body of a provision dealer's manager, aged about 40, who was fatally wounded by a Zeppelin bomb on Monday, a verdict was returned that he was "killed by a bomb from a Zeppelin that was the same night destroyed."

* * *

A delayed report from Copenhagen states that on Nov. 28th the inhabitants of Rinkjoebing, on the West coast of Jutland, saw a blazing mass high in the air over the North Sea. It was ascribed to a burning Zeppelin, but the report has not yet been confirmed.

* * *

The following extracts are from recent German newspapers which discuss the recent air raid:—

The "Lokalanzeiger" states: "The English appear to have created at last an air defence Service which is somewhat effective. However, we must note that the state of the weather was not unfavourable for them, whilst it must not be wondered at that partial losses, such as might have been expected from the beginning of the air attacks, now occur. For the rest, the extreme protection which the English Defence Service in this respect has now reached is an unwilling but undeniable admission how badly the effects of our airships' visits have been felt."

The "Hamburger Fremdenblatt" says: "With the same contempt for death with which our bluejackets go out to sea when it is a question of our chief enemy, England, our heroes of the air seek their way to the English counties as soon as our Army leadership considers the time to have come to use our aerial forces. They

know that death is lying in wait for them, for England with the passage of time has collected stupendous means of defence to beat back the dangerous enemy who comes upon him from the air. Two of our airships have met their fate. With mourning in our hearts we remember the brave who ventured and sacrificed for us their lives. We must bear this sacrifice with the full determination not to rest until England and all our enemies are ready to make peace—that peace which we must make, if we are to continue our existence."

QUESTIONS IN THE HOUSE.

On Nov. 28th, Mr. Bonar Law (Bootle), replying to Mr. Ashley (Blackpool, U.), said the debate concerning the powers of the Air Board would take place next Tuesday.

Asked by Mr. Pemberton-Billing (Herts, E., Ind.) whether hon. members would have access to Lord Curzon's report, or any part of it, before the discussion,

Mr. Bonar Law said: Certainly not. A report circulated to members of the Cabinet is not intended to be circulated to anyone else. (Cries of "Oh!")

* * *

On Nov. 30th Dr. Macnamara (Camberwell, N., L.), replying to Mr. Pemberton-Billing, who asked questions with reference to the Naval Air Squadron and Zeebrugge, said: My right hon. friend regrets that questions of this character, dealing with operations, should have been placed on the order paper. The operations referred to are under the control of the Vice-Admiral Commanding, in whose discretion the Admiralty has complete confidence. If the question is intended to convey the impression that either the Vice-Admiral or the Admiralty is not equally determined with my hon. friend—(laughter)—to harry the enemy whenever we can do so with profit, I can only assure him that he is much mistaken.

Mr. Pemberton-Billing asked whether it had come to the right hon. gentleman's notice that the bombing raids at Zeebrugge were stopped for a considerable period and not resumed until a great agitation took place in the Press and a certain naval lord wrote to Admiral Bacon and told him to do so. Dr. Macnamara: That is the substance of the question which I have said I regretted should appear on the order paper. If the hon. member has any views on this matter, all he has to do is to come and submit them to me and I will put them before the First Lord.

[One hopes that the new Sea Lord will prove more receptive of intelligent suggestions concerning the uses of aircraft than has seemed to be the case with some of their other Lordships of late.—Ed.]

* * *

On Nov. 29th Dr. Macnamara (Camberwell, N.), replying to questions by Mr. Joynson-Hicks (Brentford, U.), as to transactions in which an English barrister acted as an agent for an American aeroplane company, said no member of the staff of the First Lord of the Admiralty had acted as introducer or intermediary. He did not think he could profitably deal with other points raised until the Admiralty had full information before them as a result of the inquiries now being carried out in the United States. The inquiry already initiated would be full and searching, and he hoped the hon. member would be prepared to leave the matter at that for the time being.

Mr. Balfour, having been asked by Mr. Joynson-Hicks (Middlesex, Brentford, U.) whether No. 3 Wing of the Royal Naval Air Service, numerically the largest Wing of the Royal Naval Air Service, was sent by the Admiralty to its present position on the Continent, where it had been quartered since July, without application for either their presence or their services by Sir Douglas Haig or the general commanding the Royal Flying Corps; and whether either of these officers had the right to call on such Wing for help if needed, said: The force in question was sent in answer to a request from the French military authorities, with whom it is at present serving, and who are, I believe, much satisfied with its performances. It does not operate in the vicinity of the British line, nor is it under the British General Headquarters. But, of course, it forms part of the general forces of the Crown which can be used by the Government wherever they are most needed.

Dr. Macnamara, in answer to Mr. Joynson-Hicks, stated that 75 per cent. of the Royal Naval Air Service personnel—excluding pilots—were serving at home. There were many duties which render this necessary. The handling of airships demanded a considerable proportion of men per pilot. Then there were mechanics and men engaged on transport and administration work, officers and men engaged on instructional work, and those also employed in connection with experimental gunnery and flying work, and finally there was a proportion of the personnel employed on coast and sea patrol work. The exact percentage of the officers and men so serving who were of military age could not be ascertained without a large amount of clerical labour, but it had been estimated that about 90 per cent. come within this category.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

On Dec. 4th Mr. Joynson-Hicks (Brentford, U.) asked whether, as an enemy aeroplane had now deliberately dropped bombs on the undefended parts of London, he would consider the desirability of giving definite notice to the enemy that on any recurrence we should hold ourselves at liberty to bomb their towns by way of reprisal, Mr. Asquith replied that he did not think it desirable to give warning to the enemy of our intentions in this matter.

Mr. Pemberton-Billing expressed a desire to know whether the particular machine referred to in the question was a British or a German aeroplane.

GERMAN PRECAUTIONS AGAINST ALLIED AIRCRAFT.

Even the carefully censored Munich papers show that the French air raid on Munich on Nov. 17th caused immense excitement. The news was not published until the following day, and it was then announced that the Bavarian War Office and the Ministry of the Interior were toiling at the production of a scheme for warning the public in the event of further raids. The papers were allowed to admit that the advice previously given by the authorities had not been appreciated, and that the effect of the raid was "a sort of improvised dress rehearsal." On the morning after the raid somebody telephoned to the elementary schools and gave a fresh alarm, so that the children were sent home.

Pending the preparation of the fresh scheme, the Munich police issued the following "rules of behaviour":—

- (1) It is dangerous to stay in the open air, even on a roof or a balcony, or to stand at a window. Anybody who is in the open air should seek cover in house entrances, or underground. Ordinary doors are pierced by bomb splinters. Anybody who is in the open, and cannot reach cover, should throw himself on the ground.
- (2) It is advisable to make for cellars, or the lowest floors of houses, or other well-secured rooms. Small rooms are better than big ones. On leaving their dwellings people should see to their fires and light.
- (3) On going to bed it is advisable to place in readiness clothes and articles to which the owner attaches special value.
- (4) Vehicular traffic of all kinds will be stopped. Vehicles will, so far as possible, seek cover in house entrances and their lights will be put out.
- (5) House entrances and houses will in the evening be kept open, and persons seeking protection must be let in.
- (6) Formation of groups in the street, for instance, at places where bombs have been dropped, is forbidden.
- (7) All lights must at dusk be put out, or thoroughly shaded, and emergency lights are to be kept ready, especially in theatres, restaurants, and so on.
- (8) Bombs which have not exploded, and parts of shells, especially fuses, must not be touched, and the police must be informed when they are found.

(9) Public telephones are reserved for military and public purposes. Private telephone conversations are forbidden.

(10) News of the air attack may not be circulated.

(11) Children are to receive appropriate instructions as to their behaviour.

(12) In this, as in other matters, the main principle must be the preservation of calm and self-control.

AN IDEA FOR AN EARLY RIGID AIRSHIP.

The design for a rigid airship described in the accompanying illustration was made by Mr. C. B. Hutchinson, now of Broadstairs, at the age of 16 (he was born June 8th, 1859), when a boy in the school at Rugby, where his father, the late the Rev. Canon T. Neville Hutchinson, M.A., was for many years Natural Science Master. He showed it to the late the Hon. C. S. Rolls when he was preparing to cross the Channel, and he was much interested, and said it was the earliest drawing he had ever seen of one.

The hull design was practically that of a modern rigid ship, but with the propeller at the one end and the rudder at the other end, both being worked from the car. The principle, however, was different in that it was hoped to produce a vacuum in the hull, the air being extracted for rising. A tap is shown for letting the air in again for lowering. The inventor realised that only a portion of the air could be extracted on account of the pressure being too great on the hull.

The structure was to be a light steel or aluminium frame covered with air-proof light material.

Mr. Hutchinson is an architect by profession, and has been for some years past residing in Dover (Esplanade Hotel), and St. Margaret's Bay, and was architect for the new work at St. Margaret's, also the new General Post Office at Deal. He was also Fellow Commoner at Worcester College, Oxford, while practising there as an architect.

His eldest brother, the Rev. H. N. Hutchinson, F.G.S., is well known as an author, and wrote the "Living Races of Mankind," "Extinct Monsters," etc.

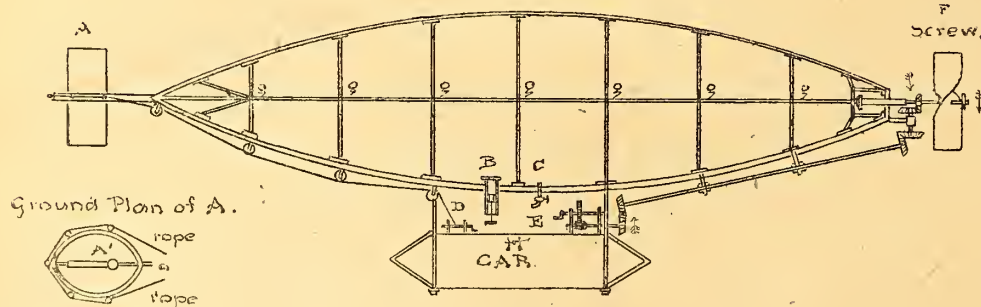
The notion was distinctly creditable for a boy of 16 so long ago as 1876, and though the impossibility of making such a design work is apparent in these days, one cannot help thinking that if encouragement had been given to such an invention in the '70's this country might have antedated Count von Zeppelin by several years.

AN INFLUENTIAL MAGAZINE

The Editor of the "Austin Advocate" wishes to point out that his paper enjoys a considerably wider circulation than that of a works magazine only, as it is circulated among the clients of the firm—who appreciate its arrival very highly. Nevertheless, the "Advocate" is fully appreciated by the large number of employees of the Austin Motor Co., Ltd.

THE NEW BALLOON.

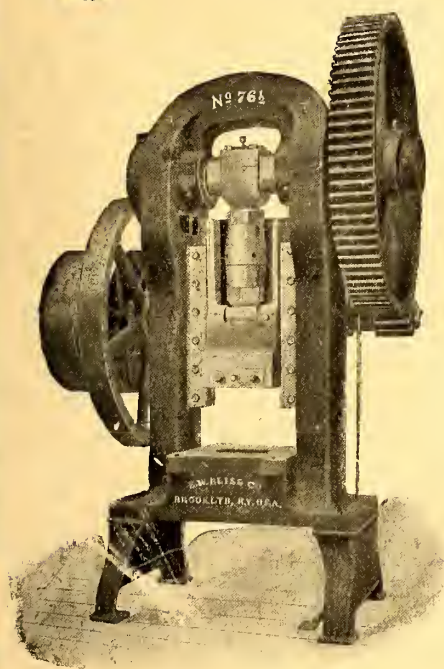
invented by.
C. Bernard Hutchinson
Jan: 1876



— NOTES —

A is the rudder and revolves on a hinge, as seen in the G.P. as A'. Also A' to a is fixed. Turn D and A does the same. B is a piston, so that when the handle is pulled, after many times the whole balloon rises, C is a tap, so that if you want to sink, you can do so, at your ease, by turning it. E is a mechanical arrangement for turning the screw. F, and when F revolves the balloon can go against the wind, g, g. are bars, strong, but light, to withstand the pressure of the air inwards, H, is a car, in which the person stands, and raises, directs, or moves, the balloon. The whole balloon is made in this shape, and also the car, to cut easily through the air.

C. Bernard Hutchinson.



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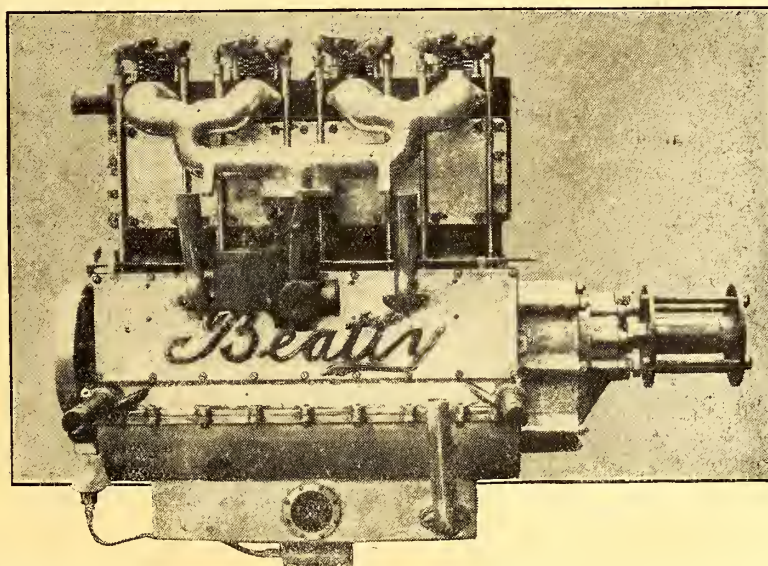
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WOMEN ENGINEERS.

THEIR TRAINING AND WORK IN THE MANUFACTURE OF AIRCRAFT.

Just as our whole attitude of life has changed, owing to this war (yes, it has changed the view point, or standpoint, of every one of us), so things are now taking place which, prior to the war, would have been dismissed as pure folly.

Women engineers! Who ever heard of it? Yet to-day it brooks no argument!—it is fact. It is a case of "to be" or "not to be," of to live or—! No argument is necessary, nor must be allowed, for our very kith and kin—all—are in this fray. Therefore, we must welcome the women engineers, and allow willingly that there is a great part they can do in engineering, as in practically every other livelihood.

As a general rule, it is the lighter parts of engineering, and not necessarily the unskilled by any means, that are most readily adaptable to women labour. Undoubtedly, with a short training, the majority of girls can readily be taught to do work of a skilled and semi-skilled nature.

Now that aeroplanes are wanted in large quantities, there must of necessity be a lot of repetition work, and if a girl has learned to use a few tools *skilfully*, she can perform quite a number of more or less simple but useful operations; and even better still if she has learned to carry a job right through, then she can fill a really important rôle.

Is the work harmful to women workers? Not in the least, if working under comfortable conditions, and in a healthy atmosphere. Is it dirty? The writer says no; but, of course, as in everything else, it is much what one makes of it.

There are those who love to display "some grime" . . . the visible trade mark of work! But it is not a necessity. Then there are the khaki overalls and caps, supplied free. Have you ever witnessed the little thrill of excitement when girls don their khaki for the first time? It sort of puts on the hall-mark that they are destined to do their bit!

Now a word as to the kind of work they do. It is common knowledge that girls are working machines of all descriptions, chiefly drilling machines, capstan lathes, milling machines, automatic machines, threading machines, grinding machines, simple presses, and so one could go on. Yes, they are doing the work successfully, and in many cases while sitting down. But stools are always provided for rest purposes.

Machine work is often thought to be monotonous, and to a certain extent that is so, varying with the kind of machine used. But still, the human element does count, for in almost every case the quality of the work depends on the amount of personal care taken.

What is perhaps a greater innovation in aircraft construction, is the amount of actual "fitting" that may be readily undertaken by girls. For the benefit of women readers it may be stated that "fitting" consists in filing, sawing, riveting, bending, measuring, assembling, cutting screw threads, etc.

In aircraft work there is an innumerable amount of small pieces of plate work, quite light work, that may be readily shaped by girls. The work is very accurate, oh very! Can you measure hundredths of an inch? Well, the degree of skill is readily acquired by practice; or better still by a short course of tuition.

There is straight filing and radius filing of almost all kinds and shapes, certainly no lack of variety, and the lines have to be watched religiously. Could you do this? Girls who have the patience and gift for using the needle—may they appreciate the point!—should have no difficulty.

Then there is a large amount of "assembling" that may be undertaken. This consists in fixing the finished parts together with bolts, nuts, split-pins, or rivets—all work of an interesting character.

Perhaps one of the greatest successes of girls' work is the oxy-acetylene welding. This is quite a business of its own, and is rather difficult to learn at the outset, but only an initial difficulty. Once this is got over, girls make most successful welders. As a rule a competent girl can master most of the welding operations in a fortnight.

One large private firm of the writer's acquaintance took the matter of dilution of labour in hand some nine months ago, and established a school within their works. Women of suitable ability were enlisted and given a short course of training, including all the operations they were likely to be called on to perform; the proper manipulation of the various tools, and the degree of accuracy required.

This was a novel venture, but it is pleasing to state that it has been most successful. The number of girls so trained now reaches close on 200.

The training was, of course, preliminary to actual work in all departments and certainly had this advantage, that girls were allocated to work for which they were most suitable. Many girls readily learn to use a micrometer and a few the vernier calliper, and have been turned to good use in the inspection department.

This idea of training seems good; it gives the girls a chance of knowing what is wanted of them, so that there is no "leaping in the dark."

In the instance cited girls were transferred to the fitting, machining, welding, tinning, and inspection departments, and in many cases have specialised on jobs of particular difficulty.

This article deals only with women labour in the engineering departments. When one recalls the opportunities offered in the woodworking, sewing, enamelling departments, etc.—there is no lack of scope in which girls may find suitable openings for their services.

Germany is unquestionably mobilising her women labour in all kinds of munition work. How else could she maintain her great reserve of man power on all her extended fronts? Obviously by organising her women labour on a basis second only to her military organisation.

That she will extend this principle during the coming winter is patent—in order that she may put her maximum effort in the field next spring and give Hindenburg his chance. So far, the women of England are doing magnificently, but much remains yet! It is hoped they will come forward voluntarily and counter-part the men's determination to win through.

"A MUNITION WORKER."

THE KITE-BALLOON HANDBOOK.

Mr. R. F. Dagnall, of Airships, Ltd., wishes it to be noted that the run on the available supply of his booklet on kite-balloons has been so great since the recent notice in *THE AEROPLANE*, as a result of which not less than 500 were sent out, that it is now completely out of stock, and, as a reprint will not be possible for some weeks, further applicants must be prepared to wait for copies.

A NEW ITALIAN CARBURETTOR.

I continue to hear great things of the Feroldi carburettor. Its principal merits are said to be its economy, its smoothness, i.e., flexibility, its cool running, and all the virtues therewith associated. Better than any amount of description a glance at the plan of the thing will serve to demonstrate its why and where.

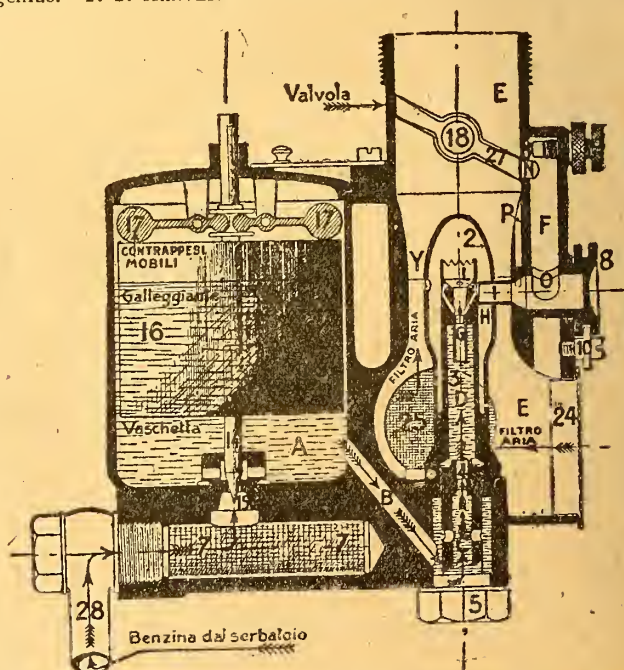
At N and P is a slide-valve actuated by the throttle 27.

Note, too, that space between the two jets through which all the "essence" has to pass, and in the first of which it is braked and broken up very thoroughly.

With the butterfly lever shut, the narrow way G I F M makes an adjustable pilot jet, of proved convenience in the case of rotaries which are sobered down in an admirable way when feeding through it.

At all positions between closed and full throttle a well-diluted mixture is provided, while there is a very fair approach to a "straight-through" action all along.

The ideal in all small, and, of course, big matters, rather than any vivid originality, is claimed as the reason of the Feroldi carburettor's success. It is, I read, much used on all sorts of craft, both officially and otherwise, and seems to have found its place in the sun on pure merit. The illustration appeared some months back in that excellent monthly which the Italian Touring Club publishes, so was current in England early in October, but other matters have till now prevented my drawing your readers' attention to this excellent instrument, fruit of Italian study and genius.—T. S. HARVEY.



The Feroldi Carburettor, which has recently been considerably written about in the Italian motor papers.



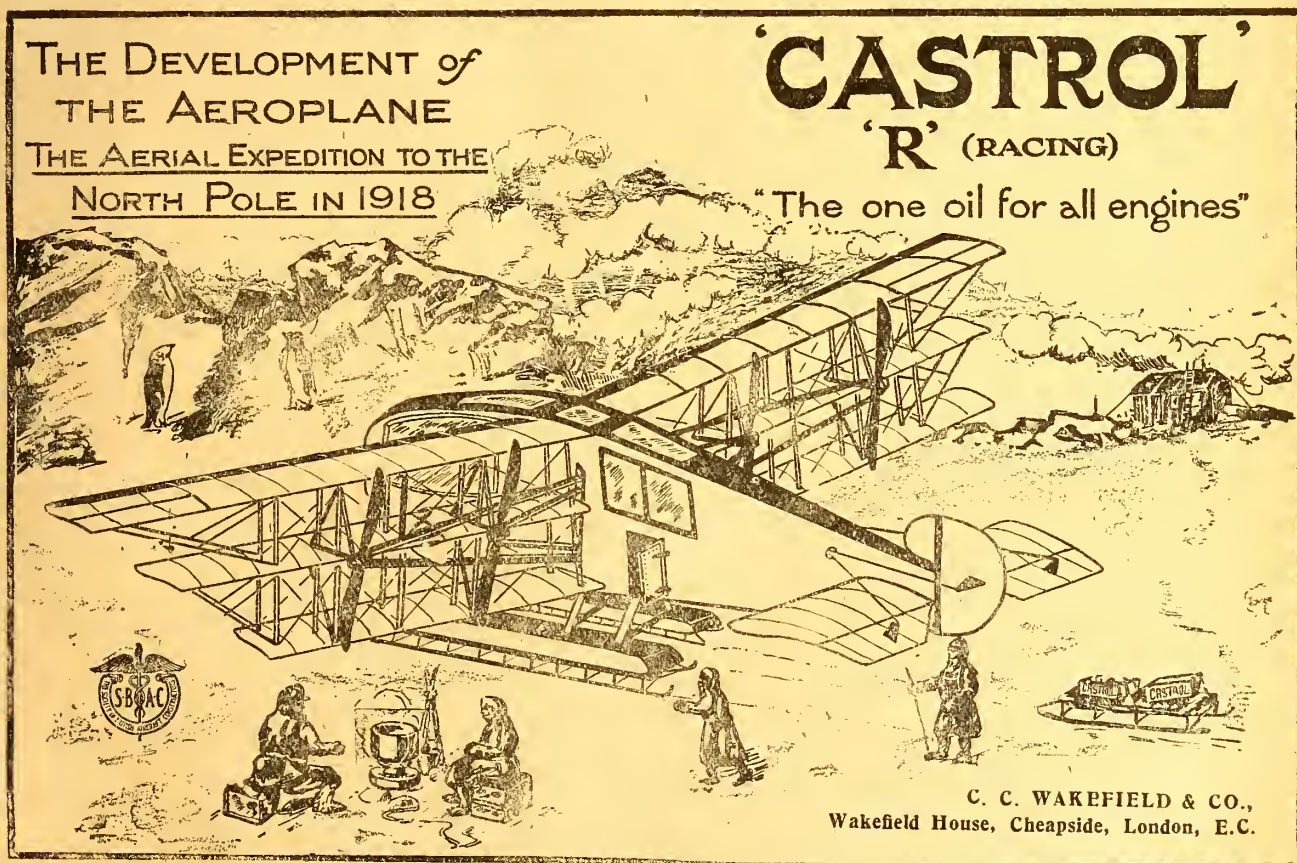
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Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

Jobbing backwards in might-have-beens is admittedly no use to help past or present, but may very well be helpful for the future. The present thing, however, being our immediate concern—in this case the Atwood "twin-six"—it seems only fair to say that whatever may have been lost in design, nothing has been apparently neglected in the construction to assure reliability: the first of aeromotor considerations.

A METALLURGICAL POINT.

To begin with, the cylinders are cast from an unusually close-grained grey iron—if one may accept its microscopic fracture diagram—which, if slightly heavier, is certainly better than a great many of the steels and "semi"-steels used for this purpose which show patches and irregular-sized lacunæ of carbon instead of an even and more or less net-like formation.

Here, as a metallurgical point, I may say that the ideal formation—which one sees perhaps once in a hundred samples or more—is a kind of hexagonal or honeycomb: and next best in my opinion is the triangle formation which is oftener found in grey iron of close grain, such as the material of these castings.

As we have already seen, the heads with the valve-seatings are formed separately. This has always been sound—and indeed conventional—marine motor practice; though the necessities of automobilism—particularly that of compelling the enthusiastic amateur to leave things alone—has made one-piece design more convenient for that purpose.

But for an aeromotor, it is unquestionably next-best to having the valves separately detachable; and if the general scheme of the design allows, the best of all is the combination of the two, because it at least assures all foundry and machine-shop accuracies and detections.

THE ATWOOD HUMORESKE.

Here I was actually going to point out once more the obvious advantage of head-detachability for valve-grinding. But I am saved from that stupidity by the official statement that the Atwood valves—which are of $1\frac{1}{2}$ in. diameter—forged as they are from tungsten steel, do not need grinding. Congratulations, indeed, upon something absolutely unique and original that no other motor man in the world has even been able to produce.

Tungsten—which we have had for quite a few years—is a more wonderful stuff than one thought; though we knew it was useful, if no better than molybdenum—and possibly one or two other things—for making high-speed steel; and enabling it, even running hot, to keep its edge for the deep big cut that spells economical production.

Only, in this case, I should like to ask how these wondrous valves were originally fitted gas-tight, if not by grinding? Or how else kept so? Or whether their seatings are likewise made of tungsten steel, and inserted in some special way? For we recollect that the cylinders are mere grey iron. Otherwise we know that seatings are prone to pit just as much as valves; which no less involves grinding. Or again, if these valves were grindable once, how are they, or the seatings, made proof against the need of re-grinding once in a while; especially when continually subjected to temperatures beside which that of high-speed tool work is as cooling streams?

Distance and "neutrality" excuse him perhaps: but Mr. Atwood really should not jest in war-time about aeromotors.

AS TO HEAD-JOINTS AGAIN.

That apart, the only question is the kind of water-joint. I regret that we are told nothing about it in the Atwood specification. Let me then say that any mere dead-flat, gasket-packed one is not to be relied upon, even on the road. Because it warps and strains and then—unless copper bound—blows out, sooner or later. I have had to replace too many of them afloat and afloat, to be unsure. Why then risk the loss of power and the forced landing, with an aeromotor? No, the only sound thing is a metal-to-metal coned or step-joint, ground in just like a valve. Then, if you like, your gasket. Which is quite a good addition, as it makes the setting-home of the bolts an easier job, with less risk of straining threads, especially threads tapped in fancy alloys.

FEATURES OF ATWOOD DETAIL.

Such an alloy—no doubt of the worthiest, none the less—is the "McAdamite" aluminium compound of which the pistons are made. I gather that they have three rings, and are machined—well, as we all do these things in 1916. Also that the gudgeon pin bronze bushings, of like quality, are duly press-fitted into place. But how

those nickel steel gudgeon pins are secured is neither told us nor pictured.

Piston displacement, however—on a respective bore and stroke of $3\frac{1}{2}$ and $4\frac{1}{2}$ inches—is 632.47 cubic inches, to an eighty pound compression. So here we can reckon for ourselves, P.L.A.N., what the actual Atwood h.p. should be.

Nickel steel is also used for the tappets—which are solid—and the rockers; which have hardened steel rollers, butting on the adjustable spring caps of the valves; and also rock in bronze bearings, pressed into the pivot-pillars.

CONNECTING RODS IN PARTICULAR.

On the other hand—so eclectic are the Atwood people—the connecting rods are of high-carbon steel, drop-forged and heat-treated. That is to say, brought in the first instance to a high, almost brittle temper, and then let down as you adapt a spring. Which for special work—and certainly there is no more vital part to take time over, especially when you do not attempt a great output—is probably the best way to get each individual rod to the exact degree of tensility or compressibility required, and to make sure that it is so, before it is ever passed into store, let alone built into an aeromotor. It is certainly a point for the Atwood score—though they do not mention it—as not every maker studies much beyond the original metal, the forging or stamping, and the machining. Incidentally, the finished rod is ten inches between centres, or an inch more than twice the stroke. Which is an excess distinctly on the right side, as it lessens angularity-thrust, and internal friction: thus saving wear, and power-leakage in its degree.

The crank-shaft, on the contrary, is chrome-nickel steel. Forged from the slab as it is, the result is not so good as when the run and grain of the original forging follows that of the cranks, journals and pins. Considerations of convenience in the machining, however, often prevent this in a small motor. But it should be quite practicable in one of this size, even allowing for the waste-thicknesses before the ground-finish dimension of $1\frac{1}{8}$ inches diameter. This stated, it will be evident that the shaft is solid, and not internally lubricated. As a fact, its seven bearings are all external pressure-fed. Like the connecting-rods, it is heat-treated after machining.

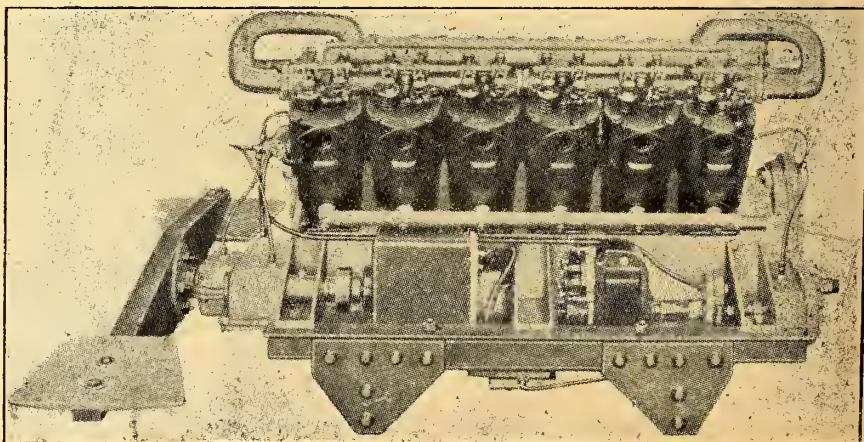
AS TO BEARINGS—ATWOOD AND GENERALLY.

The same specification as to material and treatment applies to the cam-shaft, which has a diameter of $\frac{3}{4}$ of an inch, and needs every fraction of it with its twenty-four cams, although carried in seven bearings.

As a passing word on the bearings generally, it is claimed that the babbitt metal of which they are composed—which is carried in very large bronze shells—has an unusually high percentage of tin. Now the point here is that such a percentage has this special aeromotor advantage, that in case of lubrication failure, or poor oil, the metal will stand a good deal more thrashing without running out or even binding so soon. Which may make all the difference to a war-flight; and thus scores again for the Atwood proposition.

Only it can be overdone: and if so—despite general opinion—tends to brittleness unless the original melt is made and poured with great judgment. And if and when the bind does occur on a bearing metal with a heavy tin percentage—well, it does bind. So much so that the motor must come down, and the shaft out, for a wholesale re-scraping of every bearing on the line. That is, before ever dreaming of getting that motor back into tune.

For the rest of this detail, the crank-shaft carries ball-thrust



Side View of the 120-180 h.p. Atwood Motor.

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bearings—or they it—and radial ball bearings carry the propeller-shaft, both of which are kept packed with heavy grease.

The gears—which the design of their casing alone enables to be lubricated in the same way—are, as usual in the best constructions, cut from blanks forged from chrome-vanadium steel: this forging being a flattening down—to about half the thickness of the original bloom section—in order to get the grain running radially from the centre to the edges. Then, as usual again, the gears are hardened; no doubt in one of the many ways in which potash is a dominating element.

AS TO HARDENING PROCESSES: SOME REASONS.

Such hardening, as a matter of fact, is a shelly affair at the best in these, neither more nor less than in anyone else's gears. If the strains on the teeth exceed a certain frightfulness, those teeth will shear bodily. That is why such special steel is used, as the homœopathic alloy metal gives the backing behind the hardening a stronger molecular cohesion, not because it makes the metal superficially tougher against wear until hardened.

SOMETHING NEW IN HARDENING.

There are other processes, and may nevertheless remark in this connection. One at least, to my knowledge, which will harden an ordinary inexpensive unalloyed h.c. steel right through like oil on a blotting-pad, with positively no line of demarcation. Still, being merely a proven British process, it will no doubt take us until the year after the war to find that it exists.

So it has yet to be, commercially, though curiously enough—it being possible to carry the simple process-plant to the job instead of vice versa—you could soak it through a barrette *in situ*, within fifty hours. And then—no shell-fire would flake that hardening off the backing: for there would be no backing.

The crank-chamber—to resume—is cast from the same McAdamite alloy as the pistons, in two parts. The upper one carries the fourteen bearings of crank and cam-shaft respectively, and all the webs of the former. But, as a secondary construction, each set of connecting-rods dips into a separate oil-level chamber, fed, of course, from outside: while the lower part consists of the oil-drainage and sump only.

LUBRICATION: AND THE REST OF IT.

As to the lubrication, there are several neater and simpler ways, well-enough known, than the Atwood system, which is practically unchanged from the American marine practice general enough some years ago. But still, this force feed from a common container under the

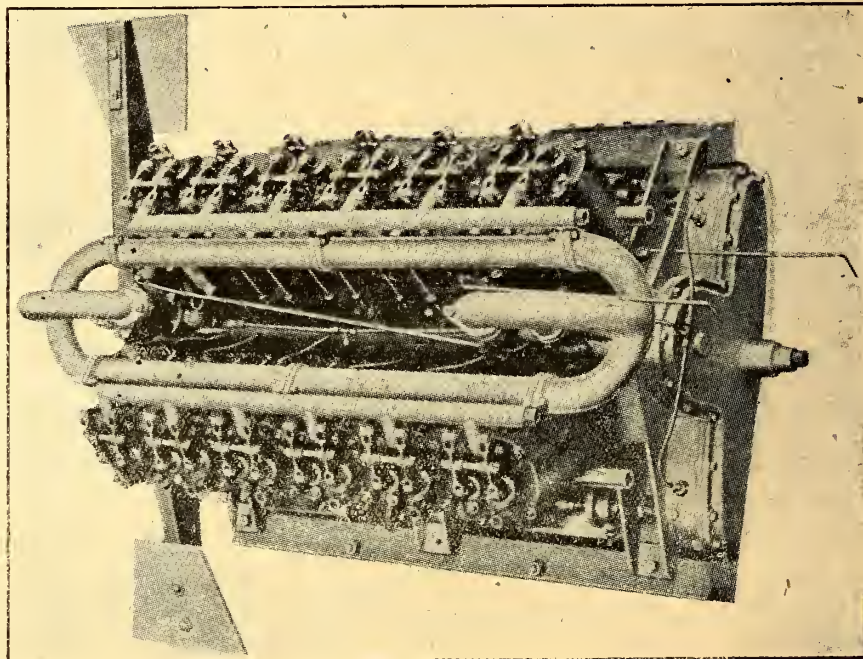
60 lb. pressure of the gear-pump, is certainly positive enough; and with such ample piping, there can be no question of the oil—as much as any part needs—getting to that part, no matter if the motor be stood upside down or sidewise up.

As to the ignition, the mere specification description suffices, that it is effected by the usual two cross-connected twelve-cylinder magnetos of the popular Splitdorf make—which must be accumulating vast wealth just now—and that the high tension wiring is carefully sheathed with fibre tubing wherever it would otherwise touch metal. Which once more excites my wonder that common motor-car practice in this respect—one of its most notable refinements for reliability—seems so neglected in the scheme—or lash-up—of aeromotor ignition, as done.

Why not—as a more appropriate adaptation of the Sheffield-Simplex idea—imbed all the wirings on each side in sets, in single thick flexible rubber rods, branching out to the plugs as they extend?

Such then is the Atwood twin-six, neither light nor heavy, but well among the average of the best in that regard. Yet, obviously enough, nowhere scamped in material for lightness sake.

(To be continued).



Top View of the 120-180 h.p. Atwood Motor.

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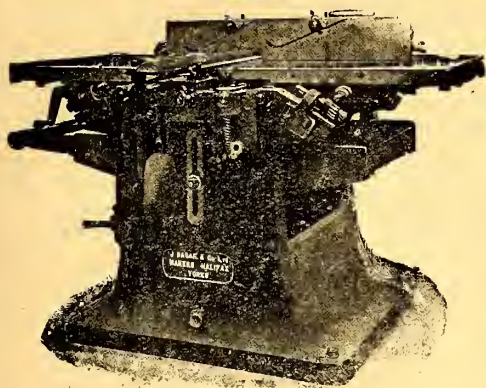
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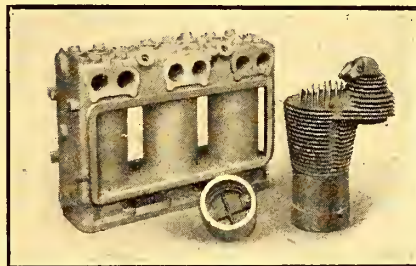
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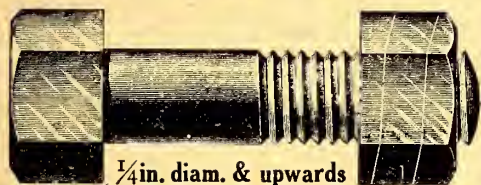
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ANSWERS TO CORRESPONDENTS.

On account of the labour involved in replying to questions from correspondents, many of which in the past have been answered over and over again by post, it has been decided to answer inquiries of general interest in the columns of THE AEROPLANE. Here followeth the first instalment:—

E. H. M. (Beckenham).—A very good book on air propellers has been written by M. A. S. Riach, entitled, "Air Screws, an Introduction to the Aero-Foil Theory of Screw Propellers," and can be purchased from the William Dawson Publishing Co., Rolls House, Breams Buildings, E.C.

J. M. C. K. (Chalford Hill).—Three-ply wood has already been tried on aeroplanes in place of fabric, but its weight has been the chief objection in the small machines at present used. Sheet aluminium has also been used for this purpose, and has the same objection. Material of some such nature may be used on really big aeroplanes of the future.

E. H. (Montrose).—The meaning of the R.A.F. series letters have already been explained in THE AEROPLANE on many previous occasions. F.E. meant Farman Experimental, R.E., Reconnaissance Experimental, B.E., Blériot Experimental, and S.E., Scouting Experimental. M.M. Farman and Blériot being at one time officially estimated as having originated the "pusher" and "tractor." The latter are now supposed to stand for "Fighting" and "British," with equal irrelevance.

W. A. (Halifax).—Air Mechanics, whether R.N.A.S. or R.F.C., are in the same position as Naval ratings, or the rank and file in other arms. They can only obtain commissions by applying through their immediate Commanding Officers. It rests with the C.O.s. to say whether their qualifications for commissioned rank are sufficient. No money guarantee is required, and in war-time it is quite possible for an officer to live on his pay. An allowance is made for kit when a commission is granted.

The procedure indicated above does not apply to those who can bring private personal influence to bear which can get their applications straight to Headquarters. Such private influence is supposed to be contrary to regulations, but it occasionally over-rides the said regulations.

J. H. (Cricklewood).—Apparently the phrase, "No person engaged on Government work need apply," is rather elastic. If a really good man has an opportunity for advancement at a new works, and if his present employer cannot give him corresponding advancement in position—leaving wages out of the question—his present employer should at least have the decency to release him with good will. If the present employer refuses, the workman has, apparently, the right to apply to a Munitions Tribunal for a release. If such a line of action were not possible it would simply mean that any new works which were established with Government approval would have to be staffed by out-of-works and incompetents who had been dismissed from other factories.

Just as new battalions are officered largely from the ranks of old and experienced battalions, so new works must draw their Foremen and Charge Hands from among the experienced bench hands of older factories. There is, moreover, nothing to prevent those who are engaging staffs for new factories from interviewing applicants from older factories even if they cannot engage them on the spot, but must wait for a release from the previous employer.

R. M. (R.E.) (Dunstable).—The Cedric Lee machine was made by a firm which has since merged into the South Coast Aircraft Company of Shoreham, and, no doubt, that firm can reply to any questions about the machine. Mr. Cedric Lee himself joined the Royal Naval Division, and was killed recently.

DE LA B. (Berkhamsted).—Passenger flights are still to be had at Hendon on Saturday afternoons and Sundays, as the military schools do not work at those times, and quite possibly if several soldiers arranged to go up together on one of these days, it might be possible for them to arrange special terms for passenger trips.

T. E. L. (Marlborough).—A very good book on engines has been written by F. J. Kean, the price of which is 6s. net, post free, from the Wm. Dawson Publishing Co., Ltd., Rolls House, Breams Buildings, London, E.C., 6s. 5d. The title of the book is "Aeronautical Engines."

A new book is being prepared by Capt. H. Barber, R.F.C., which will be published by McBride, Nast and Co., Ltd., and sold at 5s. 6d. This will be one of the best things ever done, and will cover the whole field of aviation. It will be published very shortly—about Dec. 10th.

In addition to these, a useful all-round book is that of Mr. Wm. Robson, entitled "Aircraft in War and Peace," price 2s. 6d. net; post free, 2s. 10d. It can also be obtained from the Wm. Dawson Publishing Co., Ltd.

"AVIATION" (New York).—As the result of a paragraph which appeared in THE AEROPLANE recently apropos a new American aeronautical journal, a number of inquiries have been received from readers as to how this paper may be obtained. It is hoped that arrangements may be made ere long for it to be handled in this country by the Wm. Dawson Publishing Co., Ltd., Rolls House, Breams Buildings, E.C., but, in the meantime, specimen copies may be obtained from the Gardner, Moffat Co., Inc., 120, W. 32nd Street, New York, U.S.A., by mentioning THE AEROPLANE.

H. E. W. (H. W.).—The ordinary aeroplane is slowed up in the air by the pilot throttling down the engine, dropping the tail, and thus increasing the angle of incidence of the planes, but air-brakes, consisting of variable surfaces which can be opposed to the path of flight, have been effectually used on various aeroplanes. The brakes are fitted in a much more effective manner than the way suggested, so it hardly seems necessary to proceed further.

H. C. C. (Hainetsham).—The book which will probably suit you is "The Aeroplane Speaks," by Capt. H. Barber, R.F.C., which will be published in a week or two by McBride, Nast and Co., Ltd., Rolls House, Breams Buildings, London, E.C., at the price of 5s. 6d. An announcement will be made in due course in THE AEROPLANE.

E. L. W. (Carshalton).—There is nothing to prevent a munition worker obtaining a commission in the R.F.C. if he is of sufficient social standing and has received suitable education. If accepted as a cadet he will be taught to fly at the Government's expense. Application should be made to the Department of Military Aeronautics, Adastral House, Victoria Embankment, London. Private tuition can still be obtained at the Hall School, Hendon, the Bournemouth School, at Bournemouth, and at the Midland Flying School, King's Heath, Birmingham.

W. H. H. (St. Leonards-on-Sea).—It is doubtful whether a youngster of eighteen physically fit for general service would be accepted as an Assistant Equipment Officer in the R.F.C. A flying officer of eighteen is quite likely to have to go on active service before he becomes nineteen.

M. S. (Bo'ness).—The idea of having planes lengthwise of an aeroplane body, as in the dart of one's childhood, instead of transversely, like the wings of a bird, has been tried over and over again, but it rests on an entirely false understanding of the function of a wing. The wings of a dart do not actually lift, they merely help to keep the body of the dart on a straight course, as do the feathers of an arrow, the dart itself being a projectile and

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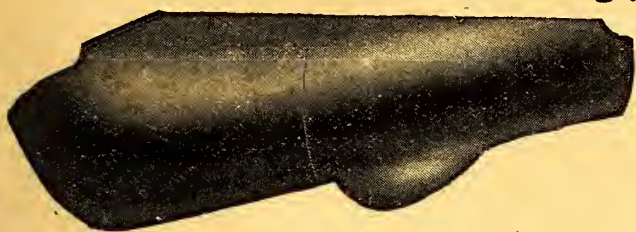
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It may be taken that the proportion between the length of leading edge of the wings, or span, as it is called, and the fore and aft dimension, or chord,—which is commonly called the "aspect ratio" of the wings—is one of the most important factors in obtaining a good lift. If the span from tip to tip be cut down, the same lift can be obtained by increasing the speed of the machine with the help of more engine power, but the same lift cannot be obtained at the same speed by simply increasing the chord.

L. C. (Dorset).—Suitable applications for appointment as cadets for the Royal Flying Corps are entertained by the Department of Military Aeronautics, and application should be made to the Director of Military Aeronautics, Adastral House, Victoria Embankment, London, E.C. Applications from enlisted men must be made through their Commanding Officers. Candidates receive nominal pay while under instruction, and after passing certain examinations satisfactorily are appointed to the R.F.C. as Second Lieutenants.

R. E. B. N. (Lowestoft).—An electrician should be a very useful man in either the R.N.A.S. or the R.F.C. Applications for enlistment in the R.N.A.S. should be made to the Recruiting Depot, Brook Green Road, Hammersmith, and for the R.F.C. either to the Regent Street Polytechnic, London, W., or the Royal Flying Corps Depot, South Farnborough, Hants.

A. E. M. (Crystal Palace).—One of the best books on aero-engines is entitled "Aeronautical Engines," by F. J. Kean, price 6s. 5d., post free, from the Wm. Dawson Publishing Co., Ltd., Rolls House, Breams Buildings, London, E.C.

H. E. H. (Great Yarmouth).—There is no book in existence dealing technically with the construction of planes and the question of wing strains on struts and flying wires. The only standard work actually dealing with stresses scientifically is M. Eiffel's book, "The Resistance of Air," in a learned tone understandable only by the scientific. A useful book for studying the conditions of normal flight is found in "Aeroplane Design," by Capt. F. S. Barnwell, R.F.C., which incorporates a series of articles on stability by Lt. W. H. Sayers, R.N.V.R. This book can be obtained, post free, from the Wm. Dawson Publishing Co., Ltd., at the above address, price 2s. 9d.

L. A. C. (Newcastle-on-Tyne).—Previous mechanical experience is not essential for candidates for commissions in the R.N.A.S. although it is desirable. The essential qualifications

are a reasonable amount of *savoir faire* and ability to learn. Applications should be sent to the Air Department, Admiralty, London, whereafter the necessary forms will be forwarded to the applicants.

Applications for enlistment in the R.F.C. should be addressed to the R.F.C. Recruiting Depot, South Farnborough, Hants., or to the Polytechnic, Regent Street, London, W. In certain localities it is possible to enlist in the R.F.C. direct. But the average recruiting office is concerned chiefly with filling vacancies in the Line and in other directly combatant units.

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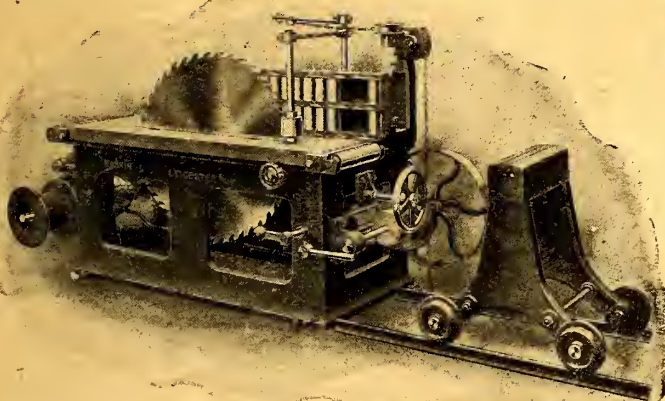
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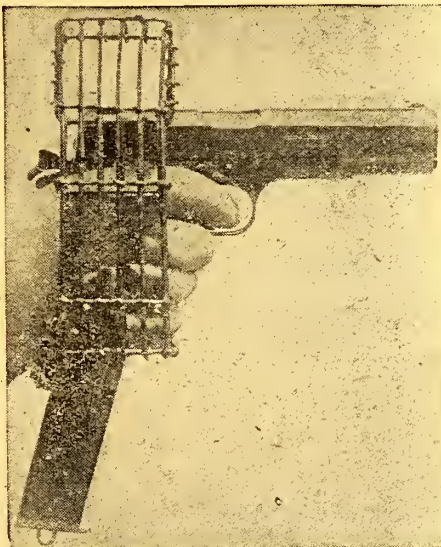
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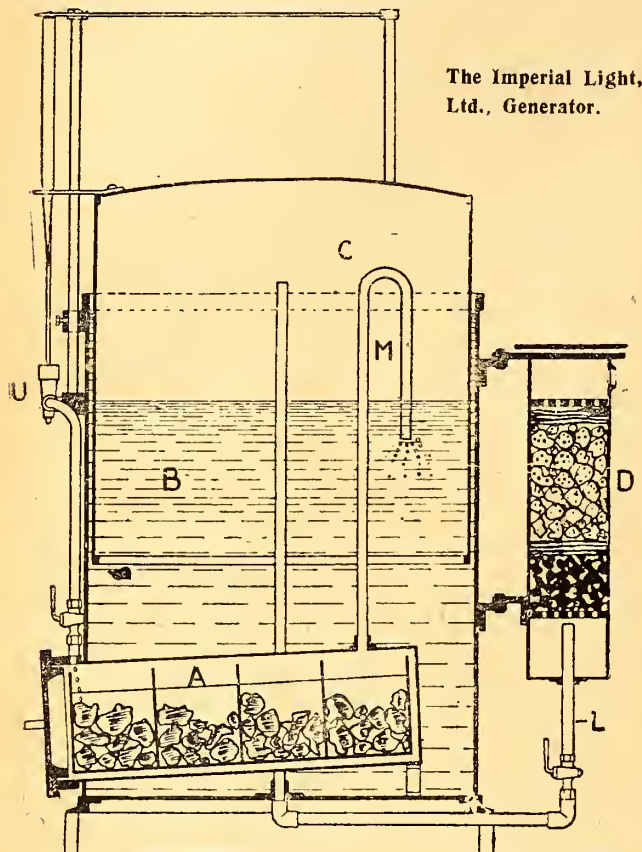
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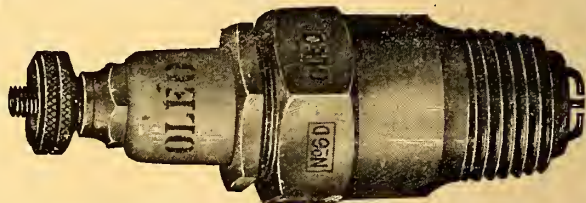
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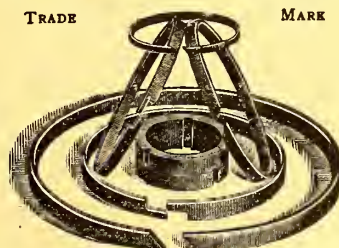
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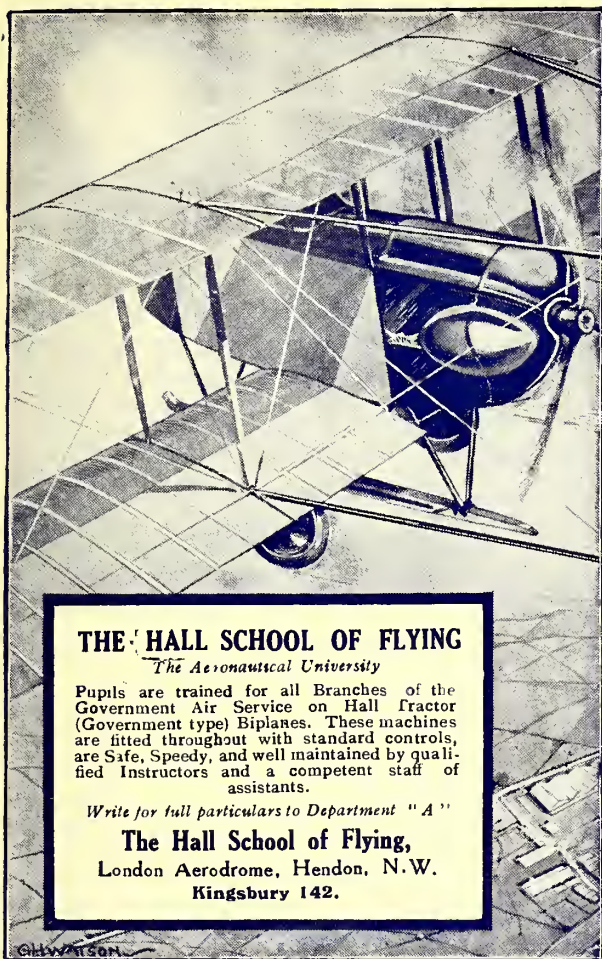
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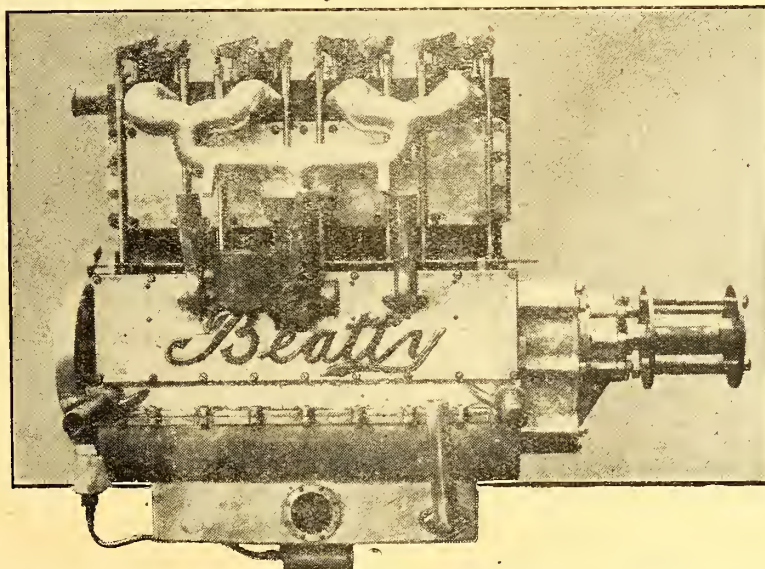
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ON DECEMBER THE SIXTH.

When the chief cities of a nation at war ring their joy-bells and decorate themselves with flags in honour of a victory over the enemy, they express not merely the nation's elation over the enemy's defeat, but the nation's joy that Peace has been brought a step nearer. Probably the latter is the dominant sentiment. We Londoners, being mongrel-English, are not given to any public demonstrations of joy, except over things that do not really matter, much as the Relief of Mafeking, or the visit of Prinz Heinrich of Somewhere-in-Germany as the guest of honour at the Guildhall or Mansion House. Nevertheless, there is a distinct if indefinable feeling in the air when the whole British nation reaches one of those psychological climaxes which in less self-controlled, or less stupid, or less bored countries—I have not discovered which mental disease is the real cause of the Englishman's lack of demonstrativeness—would lead to a public outburst of bells, banners, trumpets also and shawms, and all other kinds of musick—with a "k."

One felt it when the news of the Battle of the Marne, and the consequent saving of Paris, came through. Since then one has never felt an approach to it until Wednesday last, the historic 6th of December, when the fall of Asquith was announced. I doubt whether the fall of Sofia or Constantinople would cause as much genuine satisfaction, and I doubt still more whether it would affect the progress of the war as much. Even the truth about the Battle of Jutland and the inspired, if not inspiring, newspaper reports of the Push on the Somme, did not produce the same feeling of intense relief, nor give to everyone's face the same "Thank-God—that's-a-weight-off-my-mind" expression.

It is the irony of fate that once more, as in so many other national emergencies, England has had to call upon the Celtic Fringe for her salvation. The little down-trodden, run-to-seed Celtic nations have a curious faculty for throwing up at intervals, and generally in times of great stress, men of outstanding ability. Searchers after psychic truth have perhaps an explanation of the indisputable fact that an individual on the verge of death often becomes somehow endowed with seemingly supernatural powers of vision or of mental energy. Similarly, ascetics, by self-denial and by mortification of the flesh, attain to higher mental and psychic levels than the ordinary well-fed human being. Possibly some like process of national mortification produces at the crucial moment a man who embodies the highest qualities of the race. Which may explain why the ancient British race, forced back by the Saxon into the inhospitable fastnesses of the Welsh mountains, has produced Mr. Lloyd George.

Far be it from me to suggest that our new Prime Minister is the ideal leader of the British Empire. One would have preferred a member of one of the great fighting families who have led the nation in the past,

a Stanley or a Howard or one of the great names of history, but probably those of them who happen to be born leaders of men are already leading their men on active service, and have no time for politics. The simple soldier is of too simple a mind to dabble in the modern political puddle.

Somehow the situation reminds one of a verse in that schoolboy system of Hebrew history mnemonics to which I had occasion to refer lately. The particular example runs:—

"Goliath of Gath, he made him a path,

Which no one but he could travel,

Till David, a lad—a bit of a cad—

Knocked him head over heels with some gravel."

The modern Goliath is undoubtedly Germany, as personified in von Hindenburg, whose published portraits are by no means unlike the ogreish Goliath of our childhood. It always puzzled me to understand why David was divinely inspired to bring him down with so unsportsmanlike a weapon as a sling, for stone-throwing and the use of catapults in inter-school rows were not "as done" by the best people in my young days—nor are they now, I imagine. Hence, no doubt, the slur on David's social character in the verse quoted. Also, it used to puzzle us how the Jews, whose methods of fighting were never sportsmanlike, came to be the Chosen People. Still, there is the historical fact, and history has a wonderful way of repeating itself.

Therefore, there are reasonable historical grounds for the assumption that our modern David is the person pre-ordained for the destruction of the modern Goliath and the liberation of the Chosen People of to-day—assuming, of course, that one is a believer in the doctrine of predestination. If not, one has still the consolation that any change from the Asquith régime must be a change for the better, and that, at any rate, Mr. George is not known to have any intimate friends whose bodily or spiritual homes are in Germany.

The popular view of the Asquith defeat was well expressed by one of the first men I met on the happy Wednesday morning, who remarked: "Well, that is as good as a couple of new Army Corps, any way!" Whereupon another added: "At any rate, it means knocking six months off the duration of the war!"

Wednesday was a dull, dark, cold morning, yet everyone seemed as cheered up as if the sun had suddenly come out and driven the clouds away. Such was the moral effect of the removal of the Asquith cloud which has so long depressed the souls of the people.

In his specific dealings with aeronautical affairs, which fortunately have been infrequent, Mr. Asquith's influence has been as unhappy as in all his other dealings. My earliest recollection thereof concerns his insistence on the appointment to a commission in one of the Flying Services, through alleged feminine influence, of a singularly unpopular person: an interference with

Service routine which caused bitter dissatisfaction at the time, and created feeling which did not expire with the ultimate resignation of the individual concerned.

Of later date, one recalls his uncourteous, replies to questions in the House concerning the Flying Services, replies which were described to his face as insolent. One recalls also his flat refusal to reply to questions which, if truthfully answered, would have revealed the need for urgent reform of many matters in the Flying Services, though the disclosure of such needs would convey no information to the enemy, who is already obviously aware of them.

Furthermore, one recalls his action in appointing a "Judicial Committee" to investigate the so-called charges against the administration of the Royal Flying Corps, and refusing to include the Royal Naval Air Service in that inquiry, presumably out of deference to his old friend Mr. Balfour. The result has been that the R.N.A.S.—except for a few bright spots—has steadily gone from bad to worse, whereas the R.F.C. has undertaken and has nearly accomplished its own reformation, besides carrying out an astonishing scheme of expansion.

The report of the Judicial Committee, so carefully chosen by Mr. Asquith, is hourly expected, and, if one finds in it a skilfully composed justification of all official actions, it is only what one might expect from one's knowledge of how Service politics are worked behind the scenes, and from what one hears of little dinner-parties and private meetings.

The downfall of this Coalition Government actually dates from the day when East Herts showed that a straight man could win the support of the people of England by criticising their misrulers. The result of that election gave courage to others who had wished to criticise, but feared to be the first to break away from party ties. We now see the effect.

With the whole Asquith political clique there seems

to have been connected a social clique, a kind of private society, known as "The Souls," which came into being many years ago, when its male and female members were young and vigorous, and in its early days quaint tales were told of the manners and customs of its members. Some faint idea of its general tone may still be gathered by anyone who can find a copy of Mr. E. F. Benson's "Dodo"—a book which shocked and highly entertained our fathers and mothers.

As the members of that society of "Souls" grew older—and some of them are now very old—still more curious tales were told of them. Their removal from the Governmental side of the politico-social atmosphere can only be for good, and, if their influence and their connections could be entirely removed from British society, the air would be clearer and healthier.

In any case, December 6th deserves to go down in history as one of the Empire's emancipation days, for the removal of the Asquith incubus is the best thing that has happened to this country since the beginning of the war. It brings Peace nearer, if only because decisions, whether right or wrong, will be made quickly, and we shall not be forced to shut down the war simply because we cannot afford to carry it on any longer, as would have been the case under the old "wait and see" policy.

Mr. George must make mistakes, and so long as they are not too frequent all will be well. As I have often quoted, "The man who never makes mistakes never makes anything else." The other day a certain M.P., jokingly defending officialdom, remarked sententiously: "Mistakes have been described as milestones on the road to success." To which another member of the party replied: "Yes! But for God's sake don't let's pave the whole damned road with milestones!"

Let us hope that Mr. George may strike the happy medium between such a pavement, and a total lack of mistakes achieved by the simple process of not making any road at all.

C. G. G.

ON THE DIRECTION OF OUTPUT.

Some years ago, a Frenchman, Emile Zola by name, a man with some literary reputation, and a still higher reputation for honesty, became involved in a politico-religious controversy involving the French Army, the Hebrew race, an officer named Dreyfus, graft, personal jealousies, and quite a number of other things, with which he individually was not in the least concerned. M. Zola, with his intense love for truth and realism, wrote an attack on the military system, beginning with the famous words "J'accuse," in which he accused everybody accusable of everything of which they could be accused. The result was that he became extraordinarily unpopular. But his accusations hit the defaulters on their tenderest spots, and the necessary reforms were made.

There seems to be a need to-day for someone to write another "J'accuse" concerning the supply of matériel to the Flying Services. Personally I should like to do it. Nothing would please me better. But there are several reasons against it. In the first place, my mildly argumentative method is ill adapted to an attack such as appears necessary. Secondly, the British Law of Libel is so badly framed, and so much worse administered, that one says as a platitude: "The greater the ruth the greater the libel." Thirdly, owing to the current tribal dispute, which is commonly known as the Great European War, there is in existence a regulation known as the Defence of the Realm Act, which, though wholly excellent in itself, is sometimes interpreted by those in authority to mean that it is a criminal

offence to tell the truth openly about any official blunder or series of blunders. Fourthly, it would probably upset the regular habits of many tens of thousands of British subjects if THE AEROPLANE ceased to appear, owing to its having been suddenly extinguished by official orders, so as telling the truth in true Zolaesque style could only at best save some lives, it is scarcely worth while to try. And lastly, if I did try, I should probably only bring trouble on a number of my very best friends. Therefore, it may be better to tackle the subject gently, by way of simple questions and suggestions.

SUPPLIES OF TO-MORROW.

The other day a manufacturer of some experience summed up the whole question of supply epigrammatically by saying: "For the official in charge of supplies there should be no to-day. His to-day should always be six months hence."

He explained that, if an officer charged with providing war material contented himself with merely ordering what he knew to be the demands of the moment, he would find himself in six months' time just that much behind the demand then current in quantity and quality.

We have had examples of this in the past. When war began, the R.F.C. demanded B.E.2cs. with 70-h.p. Renaults, or the like, and they still demanded them early in 1915. The result was that they got them, and precious little else, by the end of 1915. Hence the agitation at the beginning of 1916, with its "murder charges" and "Judicial Committees" and so forth.

But if the people in control of supplies early in 1915 had looked six months ahead, and had demanded from aeroplane designers performances such as might have been reasonably expected six months later, they might have had vastly superior machines, and there would have been no "Fokker Scourge."

Be it remembered that the Sopwith "1½ strutter" existed in June or July of 1915, and might have been delivered in quantities by November of that year. It is true that the British Clerget engine was not ready for delivery then, but the monosoupape Gnome was actually in use. And, notwithstanding General Henderson's suggestion before the "Judicial Committee" that monosoupapes were unsuitable for tractor machines on account of the danger of fire, the fact remains that the Navy used them in tractor seaplanes, and still uses them, by the simple method of making an alteration which takes an hour or less to fit.

Thus one sees that things might have been very different in France at the end of 1915 if someone had thought six months ahead in June, of that year.

THE GROWTH OF THE R.F.C.

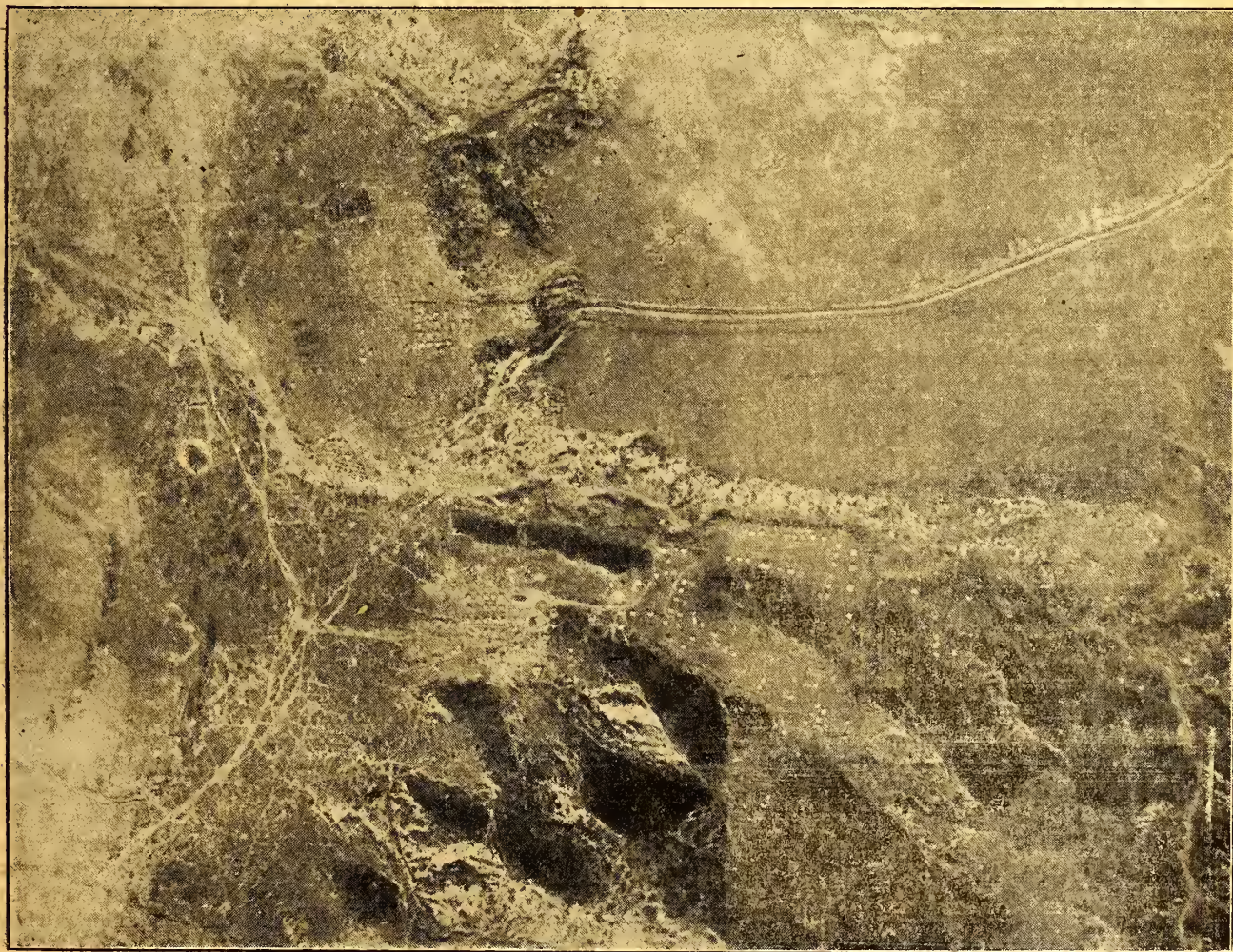
Anyone who has taken the trouble to look at the R.F.C. appointments in the "Gazettes" of the past eight or nine months can see for himself that the department at Adastral House which deals with personnel has been looking ahead very much more than six months, and when one sees the numbers of R.F.C. "cadets" who are about, apparently on week-end leave, one can form some faint idea of the numbers of R.F.C. officers who are in

training and will be appointed as pilots or observers in the near future.

The huge schools all over the country, where the elements of R.F.C. work, both on the ground and in the air, are taught to masses of pupils, prove that someone in authority somewhere is looking far ahead towards the day when the British Nation is going to be as supreme in the air as the British Navy would be on the sea—if it were not for those confounded submarines.

The whole of this enormous training scheme bears witness to the foresight of the Director of Air Organisation and his staff. Given adequate supplies of aeroplanes and engines, there is no doubt that before long the R.F.C. will be able to do all the air work the Army requires in all the theatres of war, and to do all the Home Defence work which the R.N.A.S. might have undertaken as the birthright of the British Navy, and did not attempt, and that it will, in addition, do all the offensive air work which a separate Third Service would have to do if it existed.

In fact, one is almost tempted to believe that, now its administrative offices have been moved right away from the War Office, the R.F.C. aspires to become a separate Service, merely linked to the rest of the Army, and not belonging absolutely thereto. Or one might think, at any rate, that it is preparing to become a Third Service after the war, if the R.F.C. proper is cut down to a size proportionate to the size of our Standing Army as then decreed by a Pacifist Parliament. One hopes that no such ambitions inspire the doings of those at the head of affairs, but that they will be content to remain part of that splendid organisation, the British Army.



OVER THE BALKANS.—A photograph from a French source of a Bulgarian Camp in the Balkans. The encampments on the hills commanding the road and the earthworks commanding the road from the opposite side are worth noticing.

In any case, the very obvious increase in size of the R.F.C. indicates that it is going to exceed in numbers any other single branch of the Army, except the Infantry. The point is, are the people in control of supplies thinking as far ahead as the people in control of personnel?

THEORIES AND PRACTICE.

Perhaps one should rather ask, are they capable of putting their ideas into execution? A man with a little imagination might easily think ahead to the time when we shall need 50,000 aeroplanes a year. But, apart from the fact that he would probably be thinking wrong because he would be thinking in terms of present-day aeroplanes, he might have no idea whatever of how to set about getting them.

He might think out a perfectly delightful scheme of inspection, which would avoid any chance of a defective part getting through and endangering an aviator's safety, and that very scheme might hang up his output to such an extent that he would never reach his output of a thousand machines a week.

He might, for example, have so many inspectors and examiners and viewers that he would thereby seriously deplete the available number of actual producers, whereas by increasing the quality and diminishing the quantity of his inspectors he might abolish all the lower grades in that department and set them to work as producers. The more experienced examiners would thus become foremen, or forewomen, and would be useful in training unskilled labour, and the less experienced would be, at any rate, able to turn out better work than the average, because their knowledge as viewers would teach them the class of work they were supposed to do.

HANGING UP OUTPUT.

Or, again, the man with imagination, but without experience of production, might evolve a scheme by which, if any detail fitting was discovered to be slightly defective, all further production of such a fitting would be stopped at once, so that no more material would be wasted in making it. Yet he might easily forget that necessary link in his productive system which would warn his "contracts" department that such a fitting had been condemned, and that it was necessary to order at once a supply of new type fittings to replace the old one. Also, he might forget that when the new type fitting was ordered, its production would have to be greatly accelerated, so that the output could overtake the supply of other parts already in hand.

In the latter case he might find himself with thousands of aeroplanes or engines lying about in contractors' works all over the country, practically complete, but impossible to deliver because the supply of this one fitting was unequal to the demand. And in the former case he might suddenly awake one day to the horrible fact that the new type parts had never been ordered at all, and that all his practically completed machines would have to wait for the necessary detail to be manufactured from the very beginning, with the result that they must inevitably be held up till they were utterly out of date before even the first of them could be delivered.

Even under the best circumstances, a lack of constant inter-communication between departments must cause delays. And it must be remembered that every machine lying in an erecting shop waiting for a detail fitting to finish it means delaying the production of another machine, which cannot be erected because there is no room for it.

I remember something not unlike that state of affairs in the past when a number of B.E.s. were lying in factories waiting for petrol gauges. The irony of the situation really was that the strings which operated

these gauges almost always broke a day or two after they were put into use, and the pilots simply did without them, so that all the delay and obstruction caused by waiting for the gauges, was wasted.

One might easily cause delays of the nature indicated by finding that a certain type of engine lubrication, or even the material of certain valves, or the angle of a strut-socket was wrong, and then forgetting to order or forgetting to accelerate the production of new types.

SUPER-TESTING.

Again, a clever thinker might evolve an excellent system of testing material or the performance of a machine or engine, and forget that, even if his official testers found anything wrong, the stuff ought not to be condemned without consulting the man who made it. For example, it is conceivable that some clever young official might have his own ideas of tail adjustment on an aeroplane, and fail to get the performance which the maker's own pilot got out of it. On the strength of his report the wing section of those machines might be condemned and all existing wings deleted, whereas the man who made them would probably find out at once that the testing department had adjusted the tail wrongly.

Or, to take another possibility, an engine tester might have some patent indicator of his own which he fitted to engines on test, and the fitting of it might interfere with the proper functioning of the engine without his knowing enough to know why. He would then hunt round for a reason for failing power, and would probably find some reason to satisfy himself, as, for example, valve-stems, which he considered a sloppy fit. He would naturally report accordingly, and his department, accepting his opinion as gospel, would send down to the factory and destroy all valves in stock of that type, to prevent any of them from being used.

The firm's own tester, who had passed the condemned engine before it left the works, might, if consulted first, point out at once how the test indicator detracted from the power of the engine, and could probably explain why it was necessary to have valve-stems a sloppy fit.

Yet, under such a scientific system as that suggested, material which had cost a deal of time and labour might be scrapped, and the whole output of certain engines which were badly needed on active service might be delayed for weeks.

THE TEST OF PERFORMANCE.

That is why I have always advocated putting the onus of inspection on the manufacturer, on the understanding that he will suffer heavily if anything bad goes through. After all, what the pilot on active service wants is performance, not meticulous accuracy in manufacture. If an engine gives its power he does not care whether it has valves with sloppy stems, or cylinders with precisely the correct radius of connecting curve between the gills and the outside wall, or pistons with skirts accurate to a ten thousandth of an inch.

There must be nearly as much perfectly good material wasted through being condemned for such finicky reasons as ever gets into the engines which go overseas. And it is not far otherwise with aeroplanes.

One of the most amiable aeroplanes I have ever met was a certain "pusher" which was built entirely out of material condemned by the A.I.D. The pilot of the firm which built it used it for a general hack when going across country to test machines at various aerodromes, and, if I am not much mistaken, he made it a point of honour that she should contain nothing which might have been used by the R.F.C. with A.I.D. permission. Also, my recollection is that she was rather faster and a better climber than the rest of her class.

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UNNECESSARY WEAR.

Such over-inspection and super-inspection and inspection purely for inspection's sake, and the setting up of theory against practical experience, and reliance on calculations instead of on definite test is to be avoided at all costs by the man of ideas who wants to look ahead and see how output is to keep pace not only with the needs of pilots but with novel designs and types.

Even practical tests can be overdone. For example, when once an engine of a certain type and made of certain material has been run on the test-bench till it falls to pieces, there is no need to test others of the same type and material to anything over the amount which shows that it can give its full power. There is no need to give every engine a three-hour test-run, for example, because that means absolutely nothing except taking two hours and a-half at least off the life of the engine. Assuming, for example, that a certain type of engine has to be taken down after every thirty hours' running in an aeroplane, a three-hour run means taking exactly 10 per cent. off its time in the air before it has to be overhauled.

ALL-IMPORTANT PRECEDENT.

Yet another question which still has to be settled is what place do aircraft in general occupy in the scheme of things? It is a question which the War Council itself should settle, for only that Council is capable of deciding, and on its decision actually depends the supply of aircraft. In other words, are aircraft now and in the future to be considered less important than other naval and military equipment, or more important, or equally so?

If, for example, all labour and all material in the country has to be allotted to certain specific industries, who is to have first claim? Are aeroplanes and their engines to have first claim or last? For all their importance in the public eye, and their actual war value as the eyes of the Army, and as definite weapons of offence, all the aircraft in the country do not demand much material.

A famous aeroplane manufacturer discussing this

point the other day, hazarded a guess that the actual amount of solid steel in one super-Dreadnought would go quite a long way towards supplying the material for a very big fleet of aeroplanes, so that the War Council might very well ask itself, shall we have another battleship, or shall we have a huge fleet of aeroplanes for the same expenditure of labour and material?

If the Council decided in favour of the aeroplanes the Ministry of Munitions could at once allocate labour and material to the value of an extra £5,000,000 or so to aircraft construction, which would make quite a tidy difference in both branches of supply.

So far as I can make out, hardly anyone has ever thought of the precedence of the Services in this way. Where supplies have been concerned it has always been regarded as simply a matter of money. If the nation wants a thing it pays for it and gets it. No one seems to have thought that when everyone is working his hardest and all material is "ear-marked" for one job or another months in advance, there must come a time when someone has to decide which is the most important and urgent purpose to which labour and material can be applied.

Naturally, I think aircraft should be built at all costs; equally naturally, the gunner is certain that his supply of shells is much more important; and equally naturally, the infantryman is certain that his tin hat is more urgent than an aeroplane's tin-clips. And that is why someone must decide the question of precedence. Also it is why the Aircraft Industry may be left in the cold if there is no Air Supply Department in the Ministry of Munitions. And, finally, it is why Naval and Military aircraft supply departments should reorganise themselves and put a stop to all this wicked waste of labour and material, such as occurs when expensive streamline wires are ordered for obsolete machines, or when perfectly good material is smashed up through some silly mistake in testing.

That Director of Output, of whom I wrote many moons ago, is needed more urgently now than he has ever been. Is there any chance of our seeing him appointed?

C. G. G.

THE DURATION OF THE WAR—(Continued).

BY ROGER BAYONS.

(The first article of this series appeared in THE AEROPLANE on March 3rd, 1915.)

There never was a period in the present war in which it was less possible to forecast the date of the return of peace. Standards have changed, and none has adequate knowledge of the newer objects of the nations. In the beginning of 1915 the maintenance of the Balance of Power, a living principle of international politics since the days when Cardinal Alberoni ruled with Italianate skill the chivalry of Spain, and through Spain the immediate destinies of Europe, still dominated the military policies of the belligerent Powers. To-day, scarcely two years later, it is clear that the war, in whatever manner it ends, will leave Europe completely under the control of one group of nations until that group in turn ceases to work in unity. Thus for a period one principle ceases to be of effect.

Earlier in the war a part of the programme laid down by the Allies was the enforcing of the compensation of Serbia and Belgium by the Central Powers for the damage wrought by the belligerents during hostilities. And had the war ended during 1915 in favour of the Allies, the defeated Germanic Confederation could have been forced to pay in full. The debt was then of measurable dimensions, and the German assets were extensive.

But history has altered all that. The indemnity which either side is able to wrench from the other, however

immense it may be in figures, can never replace the lost legions, nor restore the desolated provinces to their one-time prosperity. A war begun, one is told, in the defence of violated treaties and misused minor nationalities may end as a campaign of self-preservation. So from laboured reasons and justifications the simple epigram of Karl von Clausewitz will underlie the future prosecution of hostilities: "The complete overthrow of the enemy is the natural end of the art of war."

In the previous article of this series four main factors in the determination of the war were laid down, and with one addition they appear to apply to the present as adequately as to the past. They were (i) lack of men, (ii) lack of matériel, (iii) lack of food, (iv) lack of money. The fifth is "public opinion."

At the outbreak of war the population of the enemy nations were roughly as follows:—

Germany	65,000,000
Austria-Hungary	50,000,000
Turkey—	
In Europe	2,000,000
In Asia	18,000,000
Bulgaria	5,000,000
Total	140,000,000

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Of this total at least 15 per cent. would be available under modern conditions for service with the colours at home and in the field. Thus 21,000,000 men have probably been effective from a military point of view. If one allows for unreturnable casualties a number of 4,000,000, which is probably greatly in excess of the truth, as the major part of evacuated casualties ultimately return to the firing line, and none can argue seriously that the Germanic nations have up to the present sustained losses in killed, wounded, and missing of 10,000,000 or more, there are still 15,000,000 or thereabouts in the combined armies. These figures include the 1917-18 classes referred to below.

The Central Powers, whatever else they may lack, have at present no shortage of men. They can no longer afford to waste personnel in attempts to gain victories by the aid of luck and sheer weight of men, but they are not restricted in any of the proper operations of war.

Their annual accretion of recruits since the war began cannot be much less than 3,000,000, and this alone has served to maintain strengths. In another year they will begin to notice the results of having enlisted the classes of 1917 and 1918 before the due time.

It is hard to find a satisfactory method of dealing with the question of man-power in the various countries at war. One can state with a fair degree of accuracy the number of men available for service in the field with each of the four enemy nations, but calculations of this sort are valueless unless one is at the same time able to indicate the approximate strength of the Allies. Thus it is not possible in a public print to make a proper comparison without revealing facts which, whether in our favour or not, would be of value to the common enemy.

Also, there is a delusion in this matter from which even the Olympian satellites of Lord Northcliffe have been unable to escape. It is not enough to calculate armies in rifles—in effective fighting men. In modern war a true non-combatant is a drone of negative value to the country in which he lives. The day is past when a nation's fighting forces could be isolated from the nation at large.

A TRULY BELLIGERENT NATION.

The Army is no longer a profession to itself, seeking alone the splendours of the Great Adventure. A belligerent country, if success is desired, must be a nation in arms. Thus, to count the number of men the Entente can put into the field without at the same time bringing into consideration the man-power in use at home is a work of no value. An army in the field can only progress in accordance with the abundance of its munitions and supplies. Therefore it is equally necessary for the industrial personnel at home to be mobilised for the proper maintenance of the army in the field.

While Britain and her Allies have been searching for synthetic statesmanship, the enemy nations have been developing their already well-organised resources, and now to-day it is probably safe to say that little is permitted within their boundaries that is not of advantage to their military aims. Wasted energy and divided counsels are not with them, and their unity has helped the ancient fable of the faggots a little further on its weary progress through the ages.

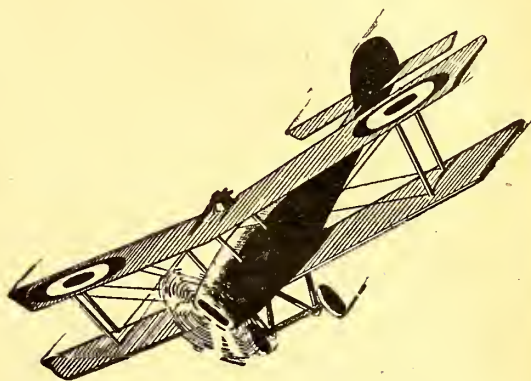
Conscription as an historic legacy has enabled the enemy to utilise properly the services of every individual within his realms. At once, when necessity demanded, it was possible to allocate each to his work, for the attributes of each were known. Emperor, statesmen, soldiers, munition workers, all began as they intended to end—in the execution of their respective duties. With us, trial and error took the place of knowledge, and in these twenty-seven months of war many thousands of Englishmen have tried various branches of military work in the search, sometimes in vain, for that which they were best fitted to do.

This being so, it is not unreasonable to say that each separate million of Germans has been more effective than twice or thrice that number of the Allies. As the months pass, this condition will change greatly as we increase in national efficiency. From this it can be argued that, while in numbers the Allies greatly exceed the Entente, they are not necessarily effectively superior. There is not likely to be much change in the proportional numbers of the opposing forces in the field unless native



IN THE BALKANS.—A landing place among the Balkan Hills, showing from ground level the type of hill seen in the photograph on page 1133. The resultant "bumps" whether there is a wind or not explain the difficulty of flying in this war area.

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troops are brought in to vary the balance. Casualties alone will not affect the proportions fighting.

The second main factor is (ii) lack of matériel. To those who delight in estimating how many times round the earth would be girdled by the number of shells expended in one day by the fighting nations, this subject has peculiar fascinations. The very immensity of the quantity of matériel used week by week has in itself a special glamour, and with that glamour a power of deception. One is so overwhelmed with the vastness of the figures that one is liable to depreciate consequently the sources of supply. Exact figures are in this case again not available, but the metals and materials in most extensive use are to be found in great quantities within the areas held by the Germanic Confederation.

They possess collieries capable of supplying the world with fuel in normal quantities for a century to come, and iron is to be found in similar abundance in Alsace-Lorraine, Serbia, and the centre of Germany. Copper is rarer, but, despite the charming feuilleton of Mr. Curtin which has recently been illuminating the columns of the "Times" and the "Daily Mail," a real shortage, capable of affecting the output of munitions, is not likely to occur for at least another two years. And so with cotton and other materials usually imported from abroad.

From time to time legislation is brought into use to restrict the employment of matériel likely to be required for military purposes. Such legislation is often misread as indicating a shortage of the reserved substances,

when it is in truth intended to avert a possible insufficiency in the future.

Prior to the war, it was a common practice of geographical publishers to print maps showing the sources of various categories of supply in the different parts of the earth. Coal, iron, marble, cotton, sheep, and material of general use were shown in true position on the map.

Study of the European sheets of such a map indicates various points not commonly dealt with in war journalism. The area controlled by Germany, including her most recent acquisition, Rumania, has within its boundaries nearly 30 per cent. of the total oil-producing lands of the world. Galicia and Rumania are now vital to the existence of the enemy. Without either, she would be crippled in the course of another year; without both, she would be ruined before the war has doubled its present duration—ruined because, while she lacked a great source of motive power (a vital necessity in modern war), the Allies would be unrestricted in supply.

The close blockade of Germany will not immediately terminate the war, even if "immediately" is read as "two years longer," but it will prevent abundance and consequent confidence.

(To be continued.)

[From the fact that Mr. Bayons entitles this article a continuation of his illuminating and prophetic utterances of March, 1915, one deduces that he is prepared to continue the series at intervals of 21 months or so for the duration of the war.—Ed.]

A MATTER OF CLUBS.

One gathers that the Royal Flying Corps Club is actually being brought into practical existence, and it is said that it is located in Bruton Street. No information is as yet forthcoming as to its precise *raison d'être*, but it is stated that it is intended rather as a hostel for young R.F.C. officers than as a Service club on a big scale. If so, its object is entirely praiseworthy. Many young officers from the Provinces and Colonies have no real home and no respectable friends in London, so it is an excellent idea to provide them with a place where they can be sure of comfortable housing and the company of their own kind, instead of casting them loose on the streets when on leave, to find promiscuous lodgings where they can in the cheaper class of hotel, where the doors open too easily, or with any casual acquaintance whom they may pick up after a visit to one of those over-decorated and under-dressed stage shows of which General Smith-Dorrien so rightly disapproves.

It has been suggested that the R.F.C. Club has really been founded to draw R.F.C. officers away from the Royal Aero Club, so that they may not be exposed therein to contaminating contact with the R.N.A.S. and with the "Trade" (Aircraft, not Submarine). It is to be regretted that the remissness of the R.Ae.C. Committee should have permitted any grounds to arise for such a suggestion.

If the R.Ae.C. had been conducted with more enterprise, it might ere now have risen to the dignity of a Service club of the first class, with the addition of a few civilian members who, owing to their technical knowledge, might have been of high value to the Service members as sources of information. As it is, the club remains practically as it was before the war, except that perhaps a few more members have joined. One hardly ever sees the members of the Committee, bar one, so that the majority of them are absolutely out of touch with the sentiments of the members, and even when the members express an opinion in a general meeting the committee appears to pay little attention to their wishes.

Senior officers of either Service, who pay their subscriptions to the club as a matter of principle, have been offered no inducement to use the premises, and, though the club does actually appear to be about to move to the long-promised new clubhouse where there are said to be so many rooms that a member desiring to sit and read or write in peace may have a chance of doing so undisturbed by the physical or conversational energy of others, there seems no reason, except the lethargy of the Committee, why the move should not have been made a year or so ago.

If the R.Ae.C. wishes to become a success as a social club, the Committee will have to take considerably more interest in the members in future, or else the members will have to find a new Committee. And, if improvements are not effected very rapidly, there is every prospect of the new R.F.C. Club taking away all R.F.C. members from the Aero Club. In which case one fails to see how the Aero Club can become anything except a mere commercial meeting-place for the Aircraft Trade, something as the Motor Club is for the Motor Trade.—C. G. G.

THE R.N.A.S. COMFORTS FUND.

The R.N.A.S. Comforts Fund continues its useful work. Last week four big cases of comforts were sent to two air stations in France. Another large consignment was sent to an East Coast air station, and parcels of games have been sent to two other East Coast air stations.

The following further contributions have been received:—A. Wigram Allen, Esq., £5; Lady Sassoon, £2 2s.; Miss E. Moccatta, £2; Mrs. I. Samuel, £1 1s.; Joseph Carless, Esq., 5s.

Further contributions in cash and kind, which are urgently needed, should be sent to Mrs. Sueter, The Howe, Watlington, Oxon.

TO BE TOLD TO THE MARINES.

The following appeared in the "Scientific American" for Nov. 25th:—

BRINGING DOWN A ZEPPELIN.—From an American who was recently engaged in airship construction near London, and was in that city during several Zeppelin raids, we gather the following particulars of the method by which one of the Zeppelins was destroyed. The attacking aeroplane carried suspended at a suitable distance below it a light grappling iron, for engaging and tearing the envelope of the Zeppelin. On the grappling-iron was mounted an electrical ignition device connected by cable with a switch placed near the aeroplane pilot. In the case when this device was successfully used, London had ample notice of the approach of the enemy, and the aviators had time to rise to sufficient height for a swooping attack on the dirigible. The exploding device was drawn successfully across the envelope, ripping it open so that the liberated gas could be ignited by the spark.

A NEW FRENCH AVIATION PAPER.

A new French weekly journal devoted to aviation, and called "La Guerre Aérienne," appeared for the first time on Nov. 16th. The Redacteur en Chef is M. Jacques Mortane, who has been connected with "La Vie au Grand Air," and the sporting paper, "Excelsior." He was responsible in the early days, with M. Alfred le Blanc, for the Société Amicale des Aviateurs—a species of aviators' trade union. In 1912, he published a book called "L'Aéronautique," which devoted a section to the fifth army, and made many prophecies of the war of the future.

"La Guerre Aérienne" is a true war paper. It devotes most of its space to the laudation of the fine French Aviation Militaire and its "sympathique aviateurs," and some very fine illustrations appear.

An interesting series of letters written by the late Brindejonc des Moulinais are published, together with an extraordinary composite picture showing his strange resemblance to the popular picture, "La Joconde." An interesting table is given of the successes of the best German pilots up till Nov. 1st, 1916.

A feature of the paper is a full-page portrait of the Sous-Lieutenant Guynemer wearing his various decorations, one of which is the Croix de Guerre with 14 "palmes."

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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Dec. 5th, 1916.

WAR OFFICE, Dec. 5th.

REGULAR FORCES.—ESTABLISHMENTS. — R.F.C. — Flt. Comdrs.—Temp. Lt. A. M. Thom, M.C., Gen. List, and to be temp. Capt. while so empld. (Nov. 1st) (substd. for notification in "Gazette" of Nov. 27). The initials of Sec. Lt. (temp. Capt.) H. F. Fisher are as now described, and not as in "Gazette" of Nov. 25th. The surname of Lt. (temp. Capt.) P. A. O. Leask is as now described, and not as in "Gazette" of Nov. 23rd.

Flying Officer.—Temp. Sec. Lt. (on prob.) D. H. Robertson, Gen. List (Oct. 22nd) (substd. for notification in "Gazette" of Nov. 8th).

Equipment Officer, 3rd Cl.—Sec. Lt. W. G. Duffield, Spec. Res., Oct. 28th.

Experimental Officer.—(Graded as an Equipment Officer, 1st Cl.)—Temp. Sec. Lt. H. W. Phear, R.A., from a Staff Lt., to be transf'd. to Gen. List, and to be temp. Capt. while so empld., Nov. 15th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. J. W. G. Mackinlay to be Capt., Nov. 18th. Sec. Lts. (on prob.) confirmed in their rank:—H. E. Jarman, D. S. Kennedy, G. V. Cottam, R. W. Farquhar. To be Sec. Lts. (on prob.)—Sec. Lt. F. G. Toy, Australian Imperial Force, Oct. 23rd. Lt. E. D. Perney, Canadian Field Art., Nov. 11th. E. H. Acland, Nov. 14th. G. E. Seymour, A. E. McVittie, N. A. Burritt, J. L. Drummond, S. L. Crowther, J. W. Gillespie, L. N. Waddell, F. W. Rook, M. C. Healy, E. N. Hatley, G. C. Atkins, H. G. Gonthier, A. Ll. Flenning, J. A. Raymond, A. McD. McBain, W. H. Falkner, R. W. Makepeace, R. F. Anderson, W. R. A. Campbell, Nov. 17th.

* * *

From the "London Gazette" Supplement, Dec. 5th, 1916.

WHITEHALL, Dec. 4th.

The King has been pleased to give and grant unto the under-mentioned Naval Officer His Majesty's Royal licence and authority to wear the decoration which has been conferred upon him by His Highness the Sultan of Egypt in recognition of valuable services rendered by him:

Fourth Class of the Order of the Nile:—Sqdn.-Comdr. CECIL JOHN L'ESTRANGE MALONE, R.N.

ADMIRALTY, Dec. 5th.

The King has been graciously pleased to give orders for the appointment of the undermentioned Officer to be a Companion of the Distinguished Service Order:—

Flt. Sub-Lt. EDWARD LASTON PULLING, R.N.A.S.

In recognition of the skill and gallantry which he displayed on the morning of the 28th of November, 1916, in pursuing out to sea, attacking at close range, and destroying a Zeppelin, which had been engaged in a raid on England. Flt. Sub-Lt. Pulling was exposed to machine-gun fire throughout the attack. The King has further been graciously pleased to approve of the award of the Distinguished Service Cross to the undermentioned Officers:—

Flt. Lt. EGBERT CADBURY, R.N.A.S.; Flt. Sub-Lt. GERRARD WILLIAM REGINALD FANE, R.N.A.S.

In recognition of the skill and gallantry which they displayed on the morning of the 28th of November, 1916, in pursuing out to sea and attacking at close range a Zeppelin which had been engaged in a raid on England. Both officers were exposed to machine-gun fire throughout the attack.

* * *

From the "London Gazette" Supplement, Dec. 6th, 1916.

WAR OFFICE, Dec. 6th.

REGULAR FORCES.—ESTABLISHMENTS. — R.F.C. — Wing Comdr.—Capt. (temp. Lt.-Col.) G. E. Todd, Welsh R., from a Sqdn. Comdr. and Asst. Comdt., Central Flying School, and to retain his temp. rank whilst so empld., Nov. 23rd.

Flt. Comdr.—Capt. C. G. Davidson, S.R., reverts to Flying Officer, Oct. 20th.

Flying Officers.—Sec. Lt. (temp. Capt.) D. D. Walrond-Skinner, Mon. R., T.F.; Sec. Lt. F. H. E. Reeve, North'd Fus., T.F., Nov. 15th. Sec. Lt. G. V. Cottam, S.R., Nov. 16th. Sec. Lt. (temp. Lt.) J. A. Williamson, R. E. Kent Yeo., T.F., from a Flying Officer (Observer), with seny. from April 28th; temp. Lt. C. G. Gilbert, Dorset R., and to be transf'd. to Gen. List; temp. Sec. Lt. A. H. Carman, Worc. R., and to be transf'd. to Gen. List, Nov. 18th.

MEMORANDUM.—E. C. Rumford to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Nov. 9th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—G. Barnett to be Sec. Lt. (on prob.), Sept. 10th.

TERRITORIAL FORCE.—R.F.C.—HAMPS. AIRCRAFT PARKS.—The announcement of the secdg. of Sec. Lt. (temp. Capt.) W. S. Farren which appeared in the "Gazette" of Nov. 7th is cancelled.

INFANTRY.—LONDON REGT.—Sec. Lt. G. A. Masters is secd. for duty with the R.F.C., Nov. 11th.

A special supplement to the "London Gazette, issued Dec. 6th, contains a dispatch, dated Oct. 8th, from Lt.-General G. F. Milne, commanding the British Forces at Salonika, describing the operations during the summer on the Struma and Dorian-Vardar Fronts. The following extracts refer to the work of the R.F.C.:—

In addition to these operations and raids, constant combats took place between patrols, many prisoners being captured, and several bombing raids were carried out by the R.F.C.

The R.F.C., in spite of the difficulties which they had to overcome and the great strain on their resources, rendered valuable assistance.

Appended to the dispatch is a list of officers, non-commissioned officers, and men whose services General Milne considers deserving of special mention, among which are the following:—

R.N.A.S.—Kilner, Capt. (temp. Maj.) C.F., D.S.O., R.M.

R.F.C.—Dawes, Maj. (temp. Lt.-Col.) G. W. P., R. Berks R.; Hudson, Capt. F.; Preston, Lt. O. I., Nolts and Derby R.; Green, temp. Sec. Lt. (temp. Lt.) G. W. M.; Thornton, Sec. Lt. (temp. Lt.) H. G., North'n R.; Whilton, No. 198 Sergt.-Maj. F.; Dorsey, No. 2669 Sergt. F.

* * *

From the "London Gazette" Supplement, Dec. 7th, 1916.

WAR OFFICE, Dec. 7th.

REGULAR FORCES.—The undermentioned N.C.Os. and men to be temp. Sec. Lts. (on prob.) for service in the field:—

MEMORANDA.—For duty with R.F.C.:—Sgt. E. H. Trump, from R.F.C., 1st Cl. Air Mech. S. de Freitas from R.F.C., 2nd Cl. Air Mech. A. G. S. de Ross, from R.F.C.; Pte. L. Y. Cardall, from A.S.C., Pte. P. Sherman, from Can. A.S.C., Nov. 10th. Sgt. W. D. Matheson, from R.F.C., Nov. 12th. Pte. F. B. Palmer, from Can. Corps Cav. R., Nov. 13th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Equipment Officer, 3rd Cl.—Sec. Lt. J. Witt-Mann, S.R., Nov. 7th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) are confirmed in their rank:—A. L. Pattinson, C. A. M. Furlonger. To be Sec. Lts. (on prob.):—E. Brown, Sept. 17th. R. S. G. MacLean, Oct. 29th. C. W. McKissock, L. H. Meyer, L. M. Hill, E. C. Macdonnell, J. B. Crompton, Nov. 5th. W. H. Bokenham, L. G. Fenner, Nov. 20th. J. C. Murray, Dec. 4th. The Christian names of Sec. Lt. (on prob.) D. U. McGregor are as now described, and not as in "Gazette" of Oct. 23rd.

TERRITORIAL FORCE.—INFANTRY.—NORF. R.—The following are secd. for duty with the R.F.C.:—Lt. G. C. H. Culley, Oct. 25th. Lt. S. J. M. White, Oct. 23rd.

DEVON R.—Sec. Lt. (temp. Lt.) R. Winnicott is secd. for duty with the R.F.C., Nov. 11th.

R. WELSH FUS.—Sec. Lt. W. Ross is secd. for duty with the R.F.C., Nov. 9th.

SCOT RIF.—Sec. Lt. T. Ure is secd. for duty with the R.F.C., Nov. 14th.

E. LANCs. R.—Sec. Lt. (temp. Lt.) R. L. Whalley is secd. for duty with the R.F.C., Nov. 13th.

DORSET R.—Sec. Lt. (temp. Capt.) H. L. H. Owen is secd. for duty with the R.F.C., Nov. 18th.

YORK L.I.—Sec. Lt. L. Butler is secd. for duty with the R.F.C., Nov. 9th.

* * *

From the "London Gazette," Dec. 8th, 1916.

ADMIRALTY, Dec. 4th.

R.N.A.S.—Temp. Proby. Flt. Sub-Lts. to be temp. Flt. Sub-Lts.:—H. R. G. Whates, Jan. 17th. S. T. Hosken, March 8th. A. J. Enstone, T. E. B. Howe, April 3rd. J. E. Potvin, April 29th. J. E. Scott, May 14th. E. J. Crisp, May 28th. E. Pierce, J. S. Wright, June 18th. R. B. Morrison, F. H. McMaster, J. de C. Paynter, June 25th. A. L. Simms, June 28th. H. F. Beamish, July 6th. J. J. Malome, July 15th. D. Plaistowe, July 18th. L. H. Cockey, July 23rd. A. W. Kay, July 30th.

WAR OFFICE, Dec. 8th.

REGULAR FORCES.—ESTABLISHMENTS. — R.F.C. — Flt. Comdrs.—The appt. of Lt. (temp. Capt.) E. B. Pretymann, Som. L.I., notified in "Gazette" of Oct. 11th, is antedated to Sept. 12th. From Flying Officers, and to be temp. Capt. whilst so empld.:—Sec. Lt. J. R. Gould, 2nd Regt., King Edward's Horse, Spec. Res., Sept. 17th. Sec. Lt. W. E. Nixon, K. O. Sco. Bord., Nov. 14th. Sec. Lt. A. G. Knight, M.C., Spec. Res., Nov. 16th. From Flying Officers:—Temp. Maj. (Capt., Ind. Army) H. A. Hill, R. Berks. R., T.F., Lt. C. L. Bath, Canadian Mach. Gun. Serv., and to be temp. Capt. whilst so empld., Nov. 17th. Lt. (temp. Capt.) A. T. Loyd, E. Kent R., T.F., and to retain temp. rank whilst so empld., Nov. 23rd. From Flying Officers, and to be temp. Capt. whilst so empld.:—Sec. Lt. C. E. H. C. Macpherson, R. Dub. Fus., Nov. 23rd. Temp. Lt. C. W. Hyde, Gen. List, Nov. 25th. Temp. Sec. Lt. O. V. Thomas, Gen. List, Nov. 27th.

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Steele's Advt. Serv.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Flying Officers.—Temp. Sec. Lt. (on prob.) J. R. W. Thompson, Gen. List, Oct. 27th. Lt. (temp. Capt.) E. E. N. Burney, M.C., R. Berks R., from a Flying Officer (Observer), with seny. from June 1st. Sec. Lt. J. A. Marshall, Hants, Cyclist Bn., T.F., Nov. 13th. Sec. Lt. (temp. Lt.) S. A. Villiers, R.A., from a Flying Officer (Observer), seny. from May 31st. Sec. Lt. A. G. A. Davis, Devon R., from a Flying Officer (Observer), seny. from May 14th, 1916, Nov. 14th. Temp. Sec. Lt. (on prob.) C. J. Thompson, Gen. List; temp. Sec. Lt. C. S. Hall, Gen. List; Lt. E. A. Thomas, Lan. R.G.A., T.F.; Lt. F. Billinge, Manch. R. Spec. Res., from a Flying Officer (Observer), seny. from May 27th. Lt. D. W. Davis, Canadian Gen. List; Sec. Lt. (temp. Lt.) P. F. J. Kent, 3rd D.G., from a Flying Officer (Observer), seny. from May 1st. Sec. Lt. A. B. Dees, R. W. Surrey R., T.F.; Sec. Lt. D. S. Kennedy, Spec. Res., Nov. 15th. Sec. Lt. (temp. Lt.) J. H. B. Wedderspoon, Lowland Divl. Ammn. Col., R.F.A., T.F., Nov. 16th. Sec. Lt. (on prob.) C. J. Pile, R.F.A., Spec. Res., from a Flying Officer (Observer), seny. from July 28th. Temp. Sec. Lt. (on prob.) C. D. Smart, Gen. List, Nov. 17th. Sec. Lt. (temp. Capt.) H. L. H. Owen, Dorset R., T.F., from Adj., temp. Sec. Lt. A. Binie, R. Sc. Fus.; Sec. Lt. A. L. Pattinson, Spec. Res.; Sec. Lt. R. W. Farquhar, Spec. Res., Nov. 18th. Sec. Lt. R. W. Buswell, Ches. Yeo., T.F.; temp. Sec. Lt. (on prob.) R. Smith, E. Surr. R., and to be transfd. to Gen. List; Sec. Lt. W. H. Markham, Manch. R., and to be sec'd., Nov. 22nd. Sec. Lt. (temp. Lt.) F. W. W. Wilson, L'pool R., T.F.; temp. Sec. Lt. (on prob.) P. Francis, Gen. List; temp. Sec. Lt. B. J. Rankin, Gen. List, Nov. 23rd.

INFANTRY.—BORDER R.—Temp. Capt. J. W. Tailford, M.C., from Gen. List, to be Capt., and to be sec'd. for service with R.F.C., Dec. 9th, but to rank for seny. from Oct. 1st, and to retain his present seny. until ordered to join a Regular unit.

MEMORANDA.—Lt. G. B. Bulman, R.F.C., Spec. Res., to be temp. Capt. (without the pay and allowances of that rank) whilst empld. as Insp., A.I.D., Oct. 1st.

E. C. Richardson to be temp. Sec. Lt. for duty with R.F.C., Oct. 11th.

Ft. Sgt. A. W. Armstrong, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with the Mil. Wing of that Corps, Nov. 15th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. to be Lts.:—G. Barrett, N. H. Read, E. A. B. Rice, J. L. Finney, (temp. Capt.) H. Tomlinson, M.C., S. J. Sibley, F. G. M. Williams, H. M. Fulton, N. Turner, W. A. Harvey, R. A. Courtney, W. O. Russell, A. W. Kilgour (temp. Capt.) E. G. Landon, V. P. Cronyn, B. Mott (temp. Capt.) F. H. Songhurst, W. T. W. Wartnaby, A. N. Buchanan, Nov. 1st. Sec. Lt. (on prob.) J. F. C. Bell resigns his commn., Dec. 9th.

ARMY SERVICE CORPS.—Sec. Lt. (on prob.) E. H. Cooper, from R.F.C. (Mil. Wing), to be Sec. Lt. (on prob.), Oct. 18th.

TERRITORIAL FORCE.—INFANTRY.—ROYAL WEST SURREY REGT.—Sec. Lt. A. B. Dees is sec'd. for duty with the R.F.C., Nov. 15th.

R. HIGHRS.—Sec. Lt. (temp. Lt.) C. F. Davies is sec'd. for duty with R.F.C., Nov. 22nd.

DURHAM L.I.—Sec. Lt. C. B. Riddle is sec'd. for duty with the R.F.C., Nov. 26th.

LOND. R.—Sec. Le. R. B. Lovemore is sec'd. for duty with the R.F.C., Nov. 26th. Sec. Lt. H. A. Cooper is sec'd. for duty with the R.F.C., Nov. 26th.

* * *

From the "London Gazette" Supplement, Dec. 9th, 1916.

WAR OFFICE, Dec. 9th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Ft. Comdrs.—And to be temp. Capts. whilst so empld.:—Temp. Lt. C. B. Cooke, Gen. List, from a Flying Officer, Sept. 27th. Temp. Lt. S. A. Meller, Gen. List, from a Balloon Officer, Oct. 24th. From Flying Officers and to be temp. Capts. whilst so empld.:—Lt. W. D. M. Bell, M.C., Spec. Res., Oct. 25th. Temp. Lt. W. J. Y. Guilfoyle, Gen. List, Oct. 27th. Sec. Lt. (temp. Lt.) G. W. Hodgkinson, County of London Yeo., T.F.; temp. Lt. E. C. Emmett, Gen. List; temp. Lt. J. Clisdal, Gen. List; temp. Lt. W. W. Carey-Thomas, Gen. List, Nov. 22nd.

Flying Officers.—Temp. Sec. Lt. J. F. Alcock, Gen. List, from a Flying Officer (Observer), Oct. 29th. seny. from Aug. 25th. Sec. Lt. F. J. Tanner, Welsh Horse Yeo., T.F., Oct. 30th. Maj. S. A. Hargraft, 90th Canadian Inf. Bn.; Lt. (temp. Capt.) H. Steward, 6th King Edward's Own Cav., Ind. Army; temp. Sec. Lt. (temp. Lt.) H. L. Lascelles, Gen. List, from a Flying Officer (Observer), seny. from Apr. 1st. Sec. Lt. (on prob.) R. T. C. Hidge, R.G.A., Spec. Res.; temp. Sec. Lt. A. Pascoe, Gen. List, Nov. 15th. Sec. Lt. W. H. Ruxton, R. Ir. R., Spec. Res., and to be sec'd., Nov. 17th. Temp. Sec. Lt. A. J. Salton, Gen. List, Nov. 20th. Sec. Lt. C. A. M. Furlonger, Spec. Res., Nov. 21st. Sec. Lt. J. B. Fenton, Middx. R., T.F.; temp. Sec. Lt. F. W. Deane, R. Ir. Rif.; Sec. Lt. (on prob.) B. Gaskin, Spec. Res.; temp. Sec. Lt. C. R. Lamrock, Gen. List; temp. Sec. Lt. G. H. S. Cregeen, Gen. List; Sec. Lt. (on prob.) H. T. Lydford, Spec. Res., Nov. 22nd. Temp. Sec. Lt. E. J. Pascoe, Gen. List; temp. Sec. Lt. H. T. O. Windsor, R. Muns. Fus., and to be transfd. to

Gen. List; Sec. Lt. (on prob.) A. C. Reeves, Spec. Res.; Sec. Lt. T. O. Clogstoun, R. War. R., and to be sec'd., Nov. 23rd.

Equipment Officers, 1st Cl.—And to be temp. Capts. whilst so empld.—Lt. R. P. J. M'Coy, Spec. Res., from the 3rd Cl.; Sec. Lt. (temp. Lt.) N. Turner, Spec. Res., from the 2nd Cl., Nov. 17th.

Equipment Officers, 2nd Cl.—From the 3rd Cl.—Lt. (temp. Capt.) J. B. Bowen, Pembroke Yeo., T.F.; Lt. G. G. Lever, R. Fus., Spec. Res., Nov. 17th. From the 3rd Cl.—And to be temp. Lts. whilst so empld.:—Sec. Lt. W. Boag, Spec. Res.; temp. Sec. Lt. A. L. Wilson, Gen. List; temp. Sec. Lt. E. E. Castle, Gen. List, Nov. 17th. Lt. S. Ransom, Spec. Res., from the 3rd Cl., Nov. 19th.

INFANTRY.—R. IR. R.—Capt. and Bn. Maj. (now Maj.) C. J. Burke, D.S.O., to be acting Lt.-Col. whilst comdg. a Bn., Lan. Fus., Oct. 20th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. to be Lts.:—W. D. M. Bell, M.C.; F. W. Day, C. F. Pittman, P. P. Eckersley, M. Hodge, W. C. Green, Nov. 1st. Sec. Lt. J. P. Porter resigns his commn., Dec. 10th.

TERRITORIAL FORCE.—R.F.C.—HAMPS. AIRCRAFT PARKS.—Sec. Lt. (temp. Lt.) F. A. Short to be temp. Capt., Nov. 1st.

Sec. Lts. to be temp. Lts.:—H. Medcalf, R. Harrison, G. S. Wilkinson, Nov. 1st.

YEOMANRY.—CHESHIRE.—Sec. Lt. R. W. Buswell is seconded for duty with the R.F.C., Nov. 22nd.

STAFFORD.—Sec. Lt. F. W. H. Thomas is sec'd. for duty with the R.F.C., Oct. 23rd.

WELSH HORSE.—Sec. Lt. F. J. Tanner is sec'd. for duty with the R.F.C., Oct. 30th.

R.F.A.—LOWLAND DIVL. AMMN. COL.—Sec. Lt. (temp. Lt.) J. H. B. Wedderspoon is sec'd. for duty with the R.F.C., Nov. 16th.

INFANTRY.—L'POOL R.—Sec. Lt. (temp. Lt.) F. W. W. Wilson is sec'd. for duty with the R.F.C., Nov. 23rd.

HAMPS. R.—Sec. Lt. D. C. Cunnell is sec'd. for duty with the R.F.C., Nov. 24th.

NORTH'N R.—Sec. Lt. V. D. Siddons is sec'd. for duty with the R.F.C., Nov. 20th.

MIDD'X R.—Sec. Lt. J. B. Fenton is sec'd. for duty with the R.F.C., Nov. 22nd.

LOND. R.—Sec. Lt. (temp. Capt.) M. B. Knowles is sec'd. for duty with the R.F.C., Nov. 26th.

* * *

From the "London Gazette" Supplement, Dec. 9th, 1916.

A special Supplement to the "London Gazette," dated Dec. 9th, contains the following:—

The President of the French Republic has bestowed the decoration "Croix de Guerre" on the following Officers and N.C.O. in recognition of their distinguished service during the campaign:—Maj. Sidney Smith, R.F.A. and R.F.C.

Capt. (temp. Maj.) Thomas Walter Colby Carthew, D.S.O., Bedford Regt., S.R. and R.F.C.

Lt. (temp. Capt.) Vernon Sidney Brown, R.F.C., S.R.

Sec. Lt. (temp. Lt.) Malcolm Henderson, D.S.O., Seaforth Highrs. and R.F.C.

3192 Cpl. Arthur Winterbottom, late R.F.C.

(There are no restrictions as to the occasions on which any of these decorations may be worn).

* * *

The King has been graciously pleased to award the Military Medal for bravery in the Field to the following Non-Commissioned Officers and Men:—

839 Sgt. D. W. Beard, R.F.C.

17518 Actg. Cpl. F. Froom, R.F.C.

10720 2nd Cl. Air Mech. B. Harrison, R.F.C.

1972 2nd Cl. Air Mech. D. P. Hepburn, R.F.C.

892 Flt. Sgt. J. B. McCudden, R.F.C.

19101 1st Cl. Air Mech. L. C. Roberts, R.F.C.

SR.7 Cpl. C. Wills, R.F.C.

* * *

From the "London Gazette" Supplement, Dec. 11th, 1916.

WAR OFFICE, Dec. 11th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Ft. Comdrs.—From Flying Officers. And to be temp. Capts. whilst so empld.:—Sec. Lt. (temp. Lt.) A. L. Macdonald, M.C., R. Highrs., Sept. 14th. Temp. Lt. H. V. Stammers, Gen. List, Sept. 19th.

Flying Officers.—Capt. R. Bell-Irving, 29th Can. Inf. Bn., July 20th (substituted for the notation in the "Gazette" of Aug. 17th). Temp. Lt. F. T. Stevens, Gen. List, from a Flying Officer (Observer), with seny. from June 21st. Sec. Lt. (temp. Lt.) T. S. Roadley, S. Staff. R., Spec. Res., from a Flying Officer (Observer), with seny. from June 21st. Sec. Lt. C. P. Thornton, L'pool R., Spec. Res., and to be sec'd. Sec. Lt. (on prob.) A. L. Constable, Spec. Res., Nov. 21st. Temp. Sec. Lt. C. C. Sharp, Hamps. R., and to be transfd. to Gen. List, Nov. 23rd.

Equipment Officers, 3rd Cl.—Capt. J. H. Jackson, ret. list, Oct. 31st. Sec. Lt. A. Burgess, Spec. Res., Nov. 24th.

SCHOOLS OF MILITARY AERONAUTICS.—Chief Instrs.—(Graded as Sqdn. Comdrs.).—From Flt. Comdrs. And to be temp. Majs.

SUNBEAM-COATALEN AIRCRAFT MOTORS

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whilst so empld.—Lt. (temp. Capt.) L. W. F. Turner, Spec. Res., Oct. 1st. Capt. A. H. Jackson, Notts. and Derby R., Oct. 25th.

Instrs.—(Graded as a Flt. Comdr.).—Sec. Lt. (on prob.) (temp. Lt.) G. J. Read, N. Staff. R., Spec. Res., from a Flying Officer, and to be temp. Capt. whilst so empld., Sept. 19th. (Graded as an Equipment Officer, 2nd Cl.).—Capt. V. O. Rees, Lond. R., T.F., from an Equipment Officer, 3rd Cl., Oct. 1st.

Examining Officer.—(Graded as an Equipment Officer, 2nd Cl.). Temp. Capt. T. E. Gilmore, Gen. List, from an Equipment Officer, 3rd Cl., Sept. 19th.

MEMORANDA.—To be temp. Lts. whilst serving with R.F.C.—Sec. Lt. R. Colles, E. Sur. R., Temp. Sec. Lt. E. L. Hyde, Temp. Sec. Lt. R. C. Bryant, Temp. Sec. Lt. F. D. Jackson, Temp. Sec. Lt. E. L. Roberts, Aug. 1st.

Sec. Lt. (on prob.) E. Christmas, from R.F.C., Spec. Res., to be temp. Sec. Lt. on Gen List for duty with R.F.C., Nov. 24th.

Temp. Hon. Lts. to be temp. Hon. Capt. whilst empld. as Insps., A.I. Dept.—A. A. Ross, H. P. Philpot, G. S. Walpole, Nov. 1st.

To be Temp. Hon. Lts. whilst employed as Asst. Insps., A.I. Dept.—A. R. Howard, F. D. Scott, W. S. Smith, A. Chapman, R. J. Grant, P. R. Callard, P. C. Thornton, A. J. Simpson, Nov. 1st.

TERRITORIAL FORCE.—YEOMANRY.—R. GLASGOW.—Sec. Lt. D. N. Thomson is sec'd. for duty with the R.F.C., Sept. 3rd. Sec. Lt. D. N. Thomson is granted the temp. rank of Lt. whilst serving with the R.F.C., Nov. 1st.

1ST CITY OF LONDON.—Sec. Lt. S. S. Hume is sec'd. for duty with the R.F.C., Aug. 15th. Sec. Lt. S. S. Hume is granted the temp. rank of Lt. whilst serving with the R.F.C., Nov. 1st.

2ND LOVAT SCOUTS.—Sec. Lt. (temp. Lt.) W. P. Brown is sec'd. for duty with the R.F.C., Nov. 3rd.

WARWICKSHIRE.—Sec. Lt. E. W. C. G. de V. Viscount Glentworth is granted the temp. rank of Lt. whilst serving with the R.F.C., Nov. 1st.

R.F.A.—E. LANCs. BRIGADES.—Sec. Lt. G. L. Owen is granted the temp. rank of Lt. whilst serving with the R.F.C., Nov. 1st. Sec. Lt. N. Clark is sec'd. for duty with the R.F.C., Aug. 1st. Sec. Lt. N. Clark is granted the temp. rank of Lt. whilst serving with the R.F.C., Nov. 1st.

LONDON BRIGADE.—Sec. Lt. C. H. Brailsford, from the R.F.C., S.R., to be Sec. Lt. (on prob.) with precedence as from Nov. 11th, Dec. 12th.

R.E.—E. ANG. DIVL. ENGRS.—Sec. Lt. G. Vaughan-Jones is sec'd. for duty with the R.F.C., Nov. 9th.

LONDON ELEC. ENGRS.—Sec. Lt. F. J. Collet is sec'd. for duty with the Aeronautical Dept., Dec. 2nd.

INFANTRY.—NORTH'D FUS.—Sec. Lt. F. H. E. Reeve is sec'd. for duty with the R.F.C., Nov. 15th.

E. LANCs. R.—Lt. J. Whittaker is sec'd. for duty with the R.F.C., Nov. 8th.

MONMOUTH R.—Sec. Lt. D. D. Walrond-Skinner is sec'd. for duty with the R.F.C., Nov. 15th.

CYCLIST BN.—Sec. Lt. J. A. Marshall is sec'd. for duty with the R.F.C., Nov. 13th.

* * *

A special supplement to the "London Gazette," issued Dec. 11th, contains the following:—

The King has been pleased to approve of the appointment of the following Officer to be Companion of the Distinguished Service Order in recognition of his gallantry and devotion to duty in the Field:—

Sec. Lt. ARTHUR GERALD KNIGHT, M.C., R.F.C.

He led four machines against 18 hostile machines. Choosing a good moment for attack he drove down five of them and dispersed the remainder. He has shown the utmost dash and judgment as a leader of offensive patrols.

The King has been pleased to confer the Military Cross on the following Officers in recognition of their gallantry and devotion to duty in the Field:—

Sec. Lt. (temp. Lt.) DURHAM DONALD GEORGE HALL, York. R. and R.F.C.

He has flown in the worst of weather and often at very low altitudes. On one occasion he flew very low under a heavy fire from the ground, in order to range our artillery.

Sec. Lt. (temp. Capt.) HAROLD JAMESON, R.F.C.

He attacked a hostile kite balloon under very heavy fire. Later, his machine descended to within 150 ft. of the ground, when he got the engine going again and recrossed our lines at 1,300 ft., and returned safely. He has on many occasions done fine work.

Temp. Lt. ROBERT JOHNSTONE, Gen. List and R.F.C.

He has shown marked courage and initiative in turning our artillery on to columns of enemy infantry. On one occasion he carried out counter battery work in cloud and mist at 800 ft. under heavy fire from the ground.

Lt. REGINALD JOHN LOWCOCK, Notts and Derby R. and R.F.C.

He beat off an attack by four enemy machines and continued his ranging. Later, he flew under 1,000 feet, in a zone full of shells, in order to silence hostile batteries.

Capt. CHARLES MACKAY, Leins. R., Spec. Res. and R.F.C.

In very unfavourable weather he obtained most valuable

photographs of the enemy's position. He fought four hostile machines for ten minutes, until assistance arrived and they were driven off; afterwards he continued his work with the artillery.

The following Officer has been awarded a Bar to his Military Cross for a subsequent act of conspicuous gallantry:—

Sec. Lt. (Temp. Capt.) JOHN OLIVER ANDREWS, M.C., R. Scots and R.F.C.

He showed great courage and determination in leading successful patrols and attacks on hostile aircraft, and has now accounted for his ninth machine. On one occasion he followed a machine down to 800 ft., on another he went down to 500 ft. M.C. awarded in "Gazette" dated Oct. 20th, 1916.

The King has been pleased to approve of the award of the Distinguished Conduct Medal to the undermentioned Non-Commissioned Officer for an act of gallantry and devotion to duty in the Field:—

3464 Sgt. B. ANKERS, R.F.C.



BILL: What does blokes want to loop the loop out 'ere for? Swank?

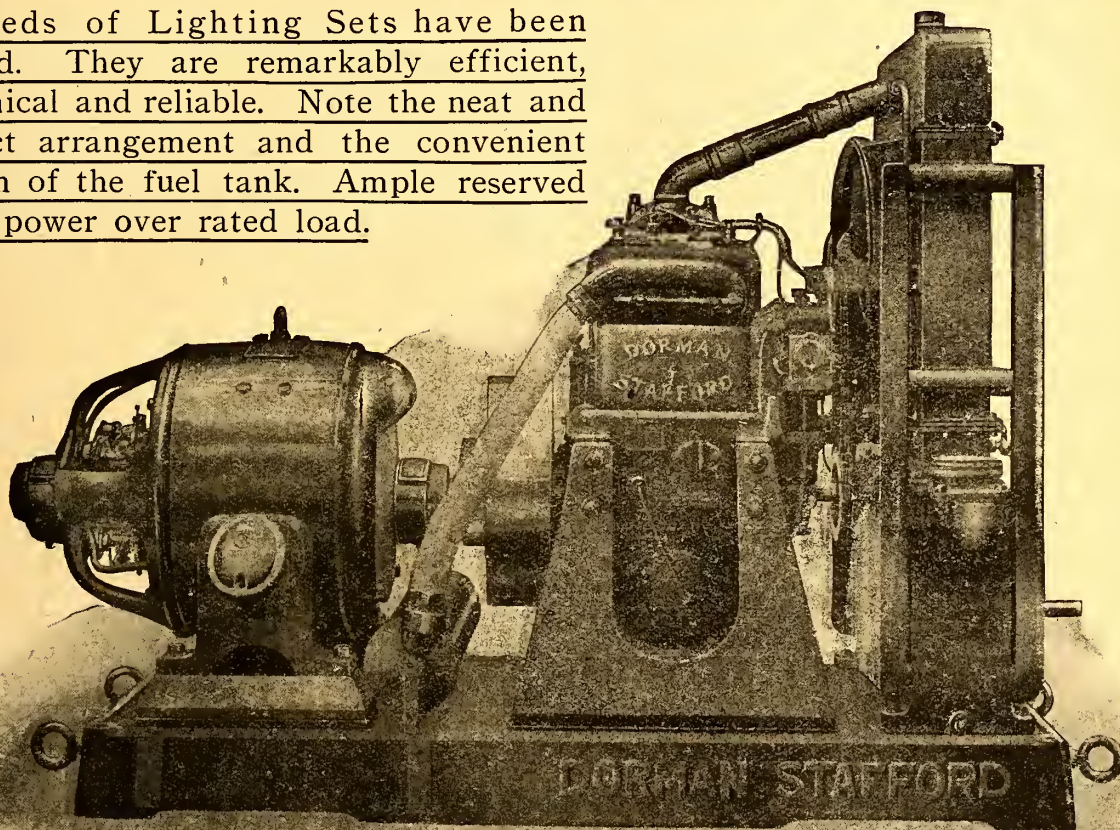
BERT: Nah! That's so as the bullets can go through the 'ole, of course.

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Dec. 9th.

The following Officers had the honour of being received by the King this morning, when His Majesty conferred upon them the Military Cross:—

Maj. TOM SMITH, R.F.C.

Capt. IAN HENDERSON, R.F.C.

Sec. Lt. CHARLES CLEAVER, R.F.C.

NAVAL.

The following appointments have been made in the R.N.A.S.:—
Dec. 6th.—The following Flt. Lts. have been apptd. as Act. Flt. Commr., seny. Dec. 3rd:—E. J. Hodson, E. A. de L. de Ville, B. P. H. de Roeper, J. S. Mills, B. Travers, A. R. Cox, R. C. Hardstaff, F. H. M. Maynard, T. F. N. Gerrard, R. B. Munday, and C. D. Morrison.

Flt. Sub-Lts.—J. K. Waugh, H. Tether, E. L. Pralle, B. S. Weinp, H. L'E. Tyndale-Biscoe, L. M. B. Weil, E. M. Morgan, C. Murray, K. C. Buss, J. C. Mitchell, A. B. Watkins, H. L. Everitt, A. H. H. Gilligan, D. G. Donald, D. R. Baylis, E. G. Scott, M. J. M. Bryan, P. D. Robertson, and G. G. McHardy, all apptd. Act. Flt. Lt., seny. Dec. 3rd.

The following have been entered as Proby. Flt. Officers (temp.), seny. Dec. 10th:—W. T. Grieve, R. Halley, L. E. Allen and J. R. Tulley.

Mr. B. G. Ludlow granted temp. commn. as Sub-Lt. (R.N.V.R.), seny. Dec. 4th.

Dec. 9th.—Messrs. A. T. Gray, L. A. Philip, H. Constant, R. L. Kent, and E. Nichols, all entered as Proby. Flt. Officers (temp.), seny. Dec. 10th, and appointed to "President," addl., for R.N.A.S.

Mr. H. V. Cherry, entered as Wt. Officer, 2nd Grade (temp.), seny. Dec. 7th, and appointed to "President," addl., for R.N.A.S.

Dec. 10th.—Flt. Sub-Lt. (temp.).—B. J. W. Brady, transferred to the permanent list of the R.N.A.S., Dec. 8th.

Dec. 11th.—The following have been entered as Proby. Flt. Officers (Temp.), seny. Dec. 17th, and appointed to "President," additional, for duty with R.N.A.S.:—R. E. Horton, W. E. N. Clark, E. B. Ball, W. H. Wilmot, C. Chrimes, A. C. Campbell-Orde, G. F. Hyams, M. A. Harker, C. S. Mossop, P. G. Shepherd, J. A. S. Wright, H. A. Wishaw, H. L. Madge, K. Stuart, G. W. Longley, G. D. Hepburn, F. N. Smith, and J. M. Mason.

CASUALTY LIST.

Reported Dec. 9th.

KILLED.—Corbett, Flt. Sub-Lt. the Hon. A. C., R.N.
ACCIDENTALLY KILLED.—Mann, Flt. Sub-Lt. A. T. O., R.N.
DIED OF INJURIES.—Frames, Flt. Sub-Lt. N. W., R.N.
MISSING (BELIEVED KILLED).—Lt. Percy M. Woodland, R.N.V.R.

Nightingale, Flt. Sub-Lt. A. J., R.N.
MISSING.—Cooper, Flt. Lt. E. J., R.N.

Lt. Lord Torrington, R.N.V.R.

Greig, Flt. Sub-Lt. C. W., R.N.

Davies, Flt. Sub-Lt. G. L., R.N.

Brimer, Flt. Sub-Lt. C. T., R.N.

SLIGHTLY WOUNDED.—Abbot, Flt. Sub-Lt. G. S., R.N.

PREVIOUSLY REPORTED MISSING (BELIEVED KILLED), NOW REPORTED PRISONER IN TURKISH HANDS.—Nightingale, Flt. Sub-Lt. Alfred J., R.N.

PERSONAL NOTICES.

DEATHS.

CORBETT.—Flt. Sub-Lt. the Hon. Arthur Corbett, R.N., who has been killed, aged 18 years, was the second son of Lord Rowallan, who formerly represented the Tradesmen Division of Glasgow in the House of Commons. He had seniority as flt. sub-lieut. of June 11th of this year.

MANN.—Flt. Sub-Lt. A. T. Osborne Mann, R.N.A.S. (killed in a flying accident on Nov. 29th), was the second son of Mr. James Elliott Mann and Mrs. Mann, of Sydney, New South Wales. He was born in 1892, and educated at St. Ignatius College, Lane Cove River, Sydney. He came to England in Oct., 1915, and obtained a commission in the Royal Naval Air Service. He took part in several raids and in attacks on Zeppelins.

MARRIAGE.

LITTLE—WATKINS.—On Dec. 7th, Flt. Lt. Ivo Cecil Little, R.N., younger son of Mr. James Little, of Normanshurst, Strood, was married to Jean Margaret, daughter of the late Col. L. G. Watkins, R.A., and Mrs. Leonard Watkins, of Exmouth, Devon, at St. Mary's Cathedral, Edinburgh, by the Rev. Canon Stewart.

MILITARY.

G.H.Q. COMMUNIQUÉ.

Dec. 5th, 10.35.—Yesterday our aircraft carried out much successful artillery and reconnaissance work, and bombed among other objectives a railway station and an aerodrome. The Naval Air Squadron had many combats and were most successful,

driving down two hostile machines out of control and forcing seven others to land.

In all two hostile machines were destroyed and four driven down out of control, in addition to those forced to land. One of our machines is missing.

* * *

WAR OFFICE COMMUNIQUÉ.

The General Officer commanding the British Forces in Mesopotamia reports:—

Dec. 8th.—TIGRIS FRONT.—On Dec. 4th hostile aeroplanes bombed our camps. In retaliation a flight of six British machines dropped half a ton of explosives on Turkish camps, and caused considerable damage.

* * *

CASUALTY LIST.

Reported Dec. 5th.

WOUNDED.—R.F.C.—Maude, 15816 Sec. Cl. Air Mech. A. L. (Halifax).

Reported Dec. 7th.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED NOT WOUNDED.—Burt, Sec. Lt. J. E., Middlesex Regt., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED AS PRISONER IN GERMAN HANDS.—Lansdale, Lt. E. C., A.S.C. and R.F.C.

Reported Dec. 8th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER OF WAR IN GERMAN HANDS.—Lowsen, Lieut. J. H., R. Scots and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Wadden, Lieut. G., R. Irish Fus. and R.F.C.

WOUNDED.—R.F.C.—Alexander, 6640 1st Cl. Air Mech. H. (Brighton).

Reported Dec. 11th.

WOUNDED.—Long, Sec. Lt. P. J., A.S.C., attd. R.F.C.

Wolley-Dod, Sec. Lt. C. F., Sherwood Foresters, attd. R.F.C.

PREVIOUSLY REPORTED PRISONER, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Briggs, Lt. L. R., London Regiment and R.F.C.

CORRECTION.—Richards, Capt. H. G., R.F.A., attd. R.F.C. (reported wounded), should read.—Rickards, Sec. Lt. H. W. B. R.F.A., attd. R.F.C.

DIED OF WOUNDS.—R.F.C.—Josling, 7600 2nd Cl. Air Mech. E. C. (Dulwich, S.E.).

WOUNDED.—R.F.C.—Mann, 8656 2nd Cl. Air Mech. W. C. (Bishop Auckland).

MISSING.—R.F.C.—Baldwin, 24130 Sgt. C. G. (Friern Barnet).

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER.—R.F.C.—Summers, 13958 Cpl. W. (Harlesden, N.W.).

Reported Dec. 12th.

WOUNDED.—Dunn, Lt. W. A., R.F.C.

Griffiths, Sec. Lt. J. C., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED A PRISONER IN GERMAN HANDS.—Roberts, Sec. Lt. C. L., S. Lancs. Regt. and R.F.C.

MISSING.—Deane, Sec. Lt. G. S., R.F.C.

WOUNDED.—R.F.C.—Sawyer, 15788 1st Cl. Air Mech. T. H. E. (Walworth, S.E.).

PERSONAL NOTICES.

DEATHS.

BREWSTER.—At an inquest on Dec. 7th on the body of Lieut. H. S. Brewster, Royal Canadian Regiment, attached R.F.C., who was killed while flying in Kent, the evidence showed that when at a height of about 200 ft. his machine nose-dived and crashed to earth, Mr. Brewster being killed instantly. It was thought he attempted to descend too steeply. A verdict of "Accidental death" was returned.

* * *


BROOKE—LOTINGA.—A double flying fatality occurred on Dec. 10th, Lts. Brooke and Lotinga, R.F.C., soon after ascent, appear to have lost control of the machine, for it was seen to nose-dive to the ground. Both aviators were killed.

* * *

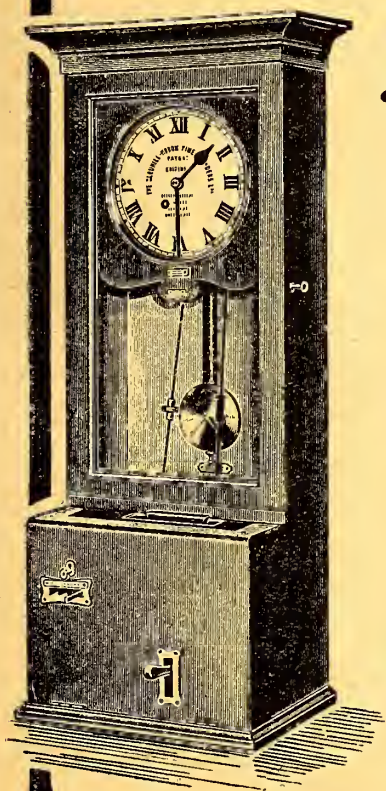
CROWTHER.—Capt. Leslie Oakes Crowther, Flt. Comdr., R.F.C., killed on Dec. 6th, was the second son of Mr. and Mrs. H. O. Crowther, of Broadclyst, Beckenham, Kent. Born in 1891, he was educated at St. Andrew's School, Eastbourne, and Malvern College, afterwards spending two years in New York and Dresden for educational purposes. Capt. Crowther joined the Royal West Kent Regt. in September, 1914, and in December, 1915, transferred to the R.F.C. For many months he had been at the front, where he was engaged in many air fights and bomb-dropping expeditions. His major writes:—"The squadron has lost a most capable and popular officer, and I cannot say how sorry I am and my officers to have lost such a good fellow."

* * *

DONNELL.—Sec. Lt. Arthur Patrick Donnell, Northumberland Fusiliers, attached R.F.C., killed in an aeroplane accident on Dec. 4th, was third son of the Rev. and Mrs. C. E. Donnell,



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Stamfordham Vicarage, Newcastle-on-Tyne. He received his commission in April of this year, and was appointed flying officer in the following July.

* * *

HEALD.—It is unofficially reported that Lt. Ivan Heald, R.F.C., has been killed in an air fight on the western front. The major commanding Mr. Heald's squadron writes of his death as follows :—

"A hostile scout dived at the machine from above, and his first burst from the machine gun must have killed or made unconscious both your son and Lt. Johnson, his pilot, as their machine nose-dived and hit the ground at a very great speed behind the enemy's lines. Those who saw it say that neither could possibly have survived."

"It was very bad luck, as they were both very good, and would undoubtedly have driven off the enemy but for that unlucky first round of fire."

"Your son was exceedingly popular with us, and all officers ask me to send you their sympathy in your loss. He was a very fine fellow, and a very good, keen observer."

At the commencement of the war Mr. Heald joined the R.N.D. at the Crystal Palace as "Seaman." Later he received a commission in the R.N.D., and went out to Gallipoli, where he was wounded. He came back to the western front with his division this year, and was promoted to full lieutenant and awarded the Military Cross. He was transferred to the R.F.C., and was acting as observer when he met his death.

* * *

HENDERSON.—Capt. C. E. P. Henderson, R.F.A., was killed on Nov. 17th, aged 29, while commanding his battery. Educated at Sumnerfields and Radley, he entered the Army through Woolwich in 1906. He was a fine all-round sportsman. He had passed his balloon course, and was an interpreter in French. During his last week's leave he obtained the Royal Aero Club's certificate as a pilot. He served from the battles of the Aisne and Marne with the R.F.A., joined the R.H.A. during Ypres, 1914, and on promotion to captain rejoined the R.F.A. He was present at the battles of La Bassée, Vermelles, Loos, Hulluch, and Hohenzollern, and was awarded the Cross of the Legion of Honour for commanding this battery during the last three battles. His name was sent up three times this year for the M.C.

* * *

JOHNSON.—Sec. Lt. Derek Sivewright Johnson, R.F.C., who was killed on Dec. 4th, aged 21, was the youngest son of Col. Frank Johnson, Royal Sussex Regiment, and of Mrs. Johnson, of Melrose House, Hove.

* * *

MILLER.—At a Hertfordshire War Hospital on Dec. 11th an inquest was held on the body of Lt. Crawford Thomas Miller, 21, of the Canadian Regt., attached R.F.C., who was killed on Dec. 9th, while flying.

It was stated that he rose to 1,000 feet, did three circuits, and then apparently began to descend. When about 100 yards from the aerodrome he appeared to "stall" the machine, which lost flying speed and dived straight to the ground. The jury returned a verdict of death through misadventure, owing to an error of judgment whilst about to land.

* * *

POWELL.—Lt. George Aubin Powell, R.F.C., a New Zealand officer, was knocked down by a motor-cyclist on Friday night near Thetford and received fatal injuries.

* * *

SPENCER.—Lt. J. M. J. Spencer, Northumberland Fusiliers and R.F.C. (killed in action), was the second son of Mr. and Mrs. R. Spencer, of Walbottle Hall, Newburn, Northumberland. A letter from his commanding officer states: "He, with five other machines, went out on an offensive patrol. Owing to a few clouds this batch got separated. However, with the greatest bravery he attacked by himself four enemy aeroplanes well over the other side of the trenches. He accounted for one which fell out of control, but was then shot down himself by the remaining three hostile machines. . . . Your son was very popular and a daring and skilful pilot." Lt. Spencer, who was 20 years of age, was educated at Alnmouth and Clifton College. He was about to enter King's College, Cambridge, when war broke out. He enlisted in the Northumberland Artillery, afterwards obtaining a commission in the Northumberland Fusiliers, receiving his second star in 1915. He transferred to the R.F.C. this year, and went out to the front in September.

* * *

STRAUSS.—Lt. Victor Arthur Strauss, R.F.C., who was killed in action on Nov. 27th during an aerial fight, was son of Mr. Arthur Strauss, M.P. for North Paddington, and Mrs. Strauss, of Kensington Palace Gardens. He joined the Service in May of last year.

* * *

THORNELY.—Sec. Lt. Maurice Thornely, Northants Regt., attached R.F.C., was accidentally killed on Dec. 3rd, 1916. He was the younger son of the late James Thornely, of Liverpool. His age was 19.

TILLARD.—Capt. and Flt. Comdr. Thomas Atkinson Tillard, Yeomanry and R.F.C., killed in action on Dec. 6th, was the younger son of the late Algernon Tillard and Mrs. Bonham Carter, of Adhurst St. Mary, Petersfield, aged 32.

* * *

WOODLAND.—The relatives of Percy Woodland, the famous steeplechase rider, have received news that he has been killed in Egypt, where he was serving with the R.F.C. He rode his first winner at Lingfield nearly eighteen years ago, and during his career took part in all the leading races under National Hunt Rules. He was only 20 years old when he won the Grand National on Drumcree, and he was the rider of Covertcoat when that horse won in 1913.

ENGAGEMENTS.

ALSTON—STEWART.—The marriage arranged between Cedric R. Alston, South Lancashire Regiment, attached R.F.C., eldest son of Mr. and Mrs. Rowland Alston, of 96, West Hill, Sydenham, and Margery Lillian, eldest daughter of Dr. and Mrs. H. M. Stewart, of Dyffryn, Dulwich, will take place quietly on January 2nd, at St. Stephen's, College Road, Dulwich (Sydenham Hill Station, South-Eastern and Chatham Railway), at 2.30. Owing to the war, there will be no reception, but all friends will be welcomed at the church.

* * *

EMLEY—HORROCKS.—The marriage of Captain Emley, R.F.C., and Miss Dorothy Horrocks, Salkeld Hall, will take place at Addingham Church on Thursday, December 28th, at 2 p.m. Owing to the war, no invitations are being sent, but friends attending the church will be welcome at Salkeld Hall afterwards.

* * *

HOWELL—RUSSELL.—The marriage of Charles Hurd Howell, Lt. R.F.C., and Margaret, daughter of the late ex-Governor William E. Russell, of Cambridge, Massachusetts, U.S.A., and of Mrs. Michael Foster, of Harrogate and San Remo, will take place on Tuesday, Dec. 19th, at the parish church, Great Shelford, Cambs, at 1 o'clock. No invitations are being sent, but all friends will be welcome.

* * *

McCLINTOCK—LAIRD.—The marriage between Ronald St. Clair McClintock, R.F.A. and R.F.C., and Miss Molly Laird will take place at 2.30 on Wednesday, Dec. 20th, at the Church of the Holy Trinity, Kensington Gore, S.W. There will be no reception, but all friends will be welcome at the church.

* * *

WILKINSON—SNELL.—The marriage arranged between Capt. Alan M. Wilkinson, D.S.O., R.F.C. and Hampshire Regt., and Miss Lina Snell will take place at St. Barnabas' Church, Addison Road, Kensington, on the 18th inst., at 2.15 p.m. All friends will be welcome at the church.

MARRIAGES.

DAVIS—PRUEN.—On Dec. 2nd, Horace John Davis, R.F.C., son of Capt. Edward Davis, R.N., and Mrs. Davis, of Gillingham, Kent, was married to Beatrice Mary Pruen, only daughter of G. H. B. Pruen, of Hundleby, at St. Mary's, Hundleby, Spilsby, by the Rev. R. Carter.

* * *

WILLIAMS—HUGHES.—On Dec. 6th, Sec. Lt. Percy Scott Williams, R.F.C., was married to Adelaide May Hughes, of Armadale, Melbourne, Australia, at St. Paul's, Covent Garden.

BIRTHS.

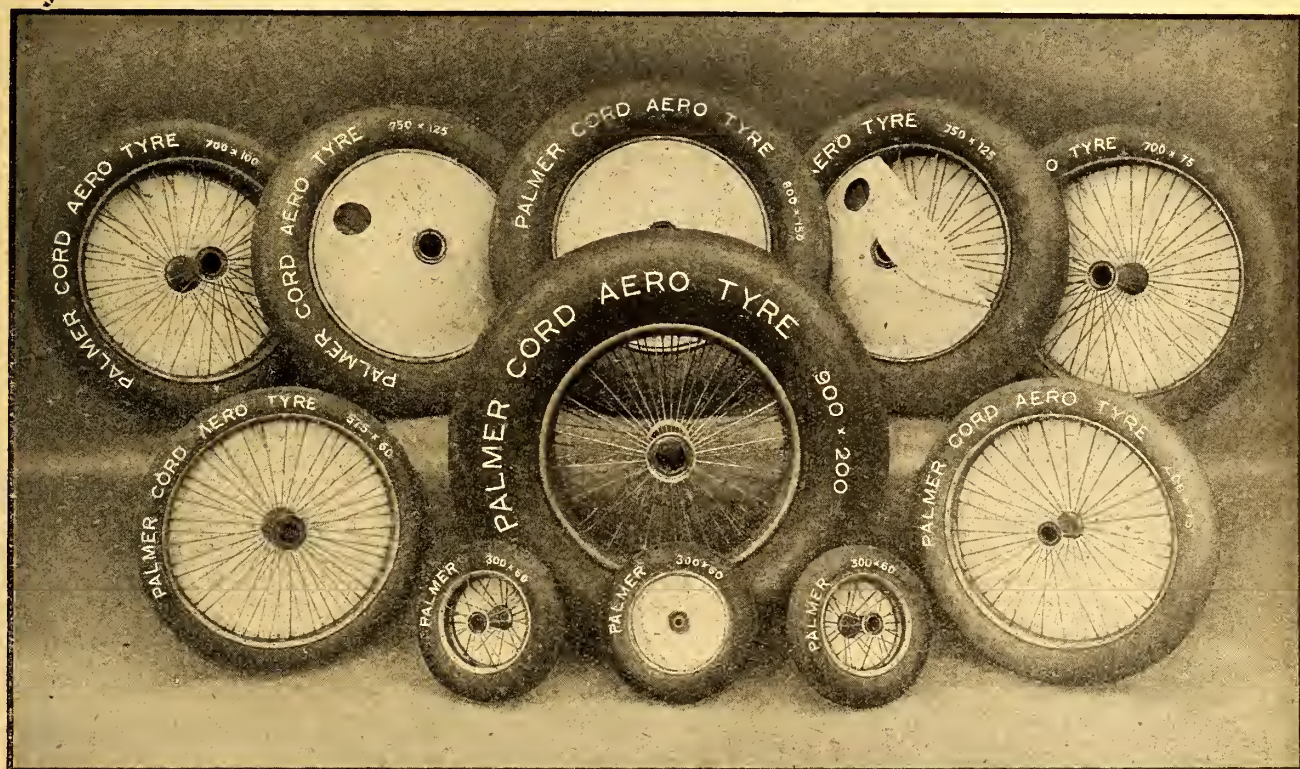
ANDERSON.—On Dec. 11th, at Devonport, the wife of J. S. Anderson, R.F.C., of a son.

* * *

WARD.—On the 5th Dec., at Mortimer Lodge, Romford Road, Forest Gate, Essex, the wife of F. Ward, R.F.C., of a daughter.

The dispatch from the G.O.C. in the Balkans mentions the name of Major (Temp. Lt.-Col.) G. W. P. Dawes, Berkshires and R.F.C., for services in that war area. Col. Dawes is one of the earliest officers of the R.F.C., having joined the Corps on its formation. He is also one of the earliest of British aviators, his certificate being No. 26, awarded in the early days of 1911. He was one of the first competition fliers, having piloted a Blériot at the Wolverhampton Meeting in June, 1910. Thereafter he flew certain Humber-built copies of Blériots at Allahabad, while with his regiment, and was actually the first British officer to pilot an aeroplane in India. After the formation of the R.F.C. he was stationed at Montrose with the famous No. 2 Squadron, and made several notable journeys between Montrose and Farnborough. He went to France with the historic Five Squadrons at the very beginning of the war, and was awarded the Legion of Honour by the French. Later he commanded a training establishment on Salisbury Plain, and thence took command of the Wing in the Balkans.

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300×60	16	111.12	25.4	Central	700×75	9	178.	44.45	132/46	750×125	18	178.	44.45	132/46
"	17	72.39	12.7	Central	"	20	178.	38.09	132/46	"	26	150.	40.	Central
					"	75	178.	31.75	132/46	"	33	150.	38.09	Central
450×60	30	89.	31.75	Central	"	80	178.	44.45	132/46	"	38	178.	38.09	132/46
										"	66	178.	38.89	132/46
575×60	14	150.	38.09	104/46	700×100	2	185.	55.	135/50	800×150	8	185.	55.	135/50
"	21	160.	28.	Central	"	4	185.	55.	Central	"	10	185.	55.	Central
"	34	150.	31.75	104/46	"	18	178.	44.45	132/46	"	36	185.	55.	135/50
					"	26	150.	40.	Central	"	40	185.	60.32	135/50
600×75	14	150.	38.09	104/46	"	33	150.	38.09	Central					
"	21	160.	28.	Central	"	38	178.	38.09	132/46	900×200	42	185.	60.32	125/60
"	34	150.	31.75	104/46	"	66	178.	38.89	132/46	"	47	185.	55.	125/60
					750×125	2	185.	55.	135/50	1100×200	52	185.	55.	116/69
					"	4	185.	55.	Central	"	57	185.	55.	Central

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

The "Gazette" of Dec. 9th notes the appointment of Capt. (Bt. Maj.) C. J. Burke, D.S.O., Royal Irish Regt., to command a battalion of the East Lancs. Regt. Col. Burke was one of the first British Army aviators, having been a member of the Aeroplane Company of the Air Battalion, R.E. He took his certificate in France on a Farman, and thereafter flew a great deal at Farnborough and on Salisbury Plain. On the formation of the R.F.C. he took command of No. 2 Squadron at Montrose, and was responsible for the various journeys of his squadron between that place and Farnborough, flights which in those days were quite out of the ordinary. He commanded No. 2 Squadron in France in the early part of the war, and was awarded the D.S.O. Thereafter he was appointed Commandant of the Central Flying School. Thence he was transferred to command a battalion of infantry in France, where he was, one gathers, slightly injured during the Battle of the Somme some months ago.

* * *

Unless there is a printer's error, there is one of the curiosities of military routine in the "Gazette" of Dec. 11th, wherein it is notified that "Sec. Lt. (on prob.) (temp. Lt.) G. J. Read, N. Staff. Regt., Spec. Res.," is appointed Instructor at a School of Military Aeronautics, and becomes temp. Capt. while so employed. It may seem curious, even to the unsophisticated soldier, that an officer who is regarded by his immediate superiors as possessing such ability as to be entrusted with the instruction of others, and to be worthy of the rank of captain, should still be officially considered as on probation, or, in other words, as not having convinced the high authorities of his suitability to be confirmed in commissioned rank. These quaint methods of officialdom help to relieve the dreariness of the daily task.

* * *

Sec. Lt. Shackel, who has been promoted from the ranks for service in the field, was one of the first 50 men asked for by the R.F.C. to take up wireless. He enlisted in Sept. 1915, and was for four months at the British School of Telegraphy, London. He was sent out to France in Feb., 1916, and on Oct. 13th, on the field, was made second lieutenant.

He was trained for a schoolmaster at Reading University College, the first year, and then passed the London University Inter B.Sc.

* * *

Lt. A. J. Evans, R.F.C., a well-known Oxford University cricketer, reported missing, is a prisoner in Germany.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Dec. 5th.—Yesterday Sous-Lt. Nungesser successively brought down on the Somme front two German machines, the first at 12.15 p.m., and the second at 1.5 p.m. One of the machines came crashing to the ground 300 yards west of Nurlu, north-east of Péronne. The other fell in flames in the Vallulart Wood, east of Léchelle (north of Nurlu).

These two successes bring the number of enemy machines forced down by Sous-Lt. Nungesser to 20.

Dec. 6th.—It is confirmed that Adjutant Dorme brought down on the 4th inst. his 17th enemy aeroplane. The machine fell from a height of 1,900 ft. near Mons-en-Chaussée, south-east of Péronne.

The same day Maréchal de Logis Viallet brought down his seventh enemy aeroplane, which fell from a height of 2,300 ft. east of Beugny, east of Bapaume.

Dec. 10th (afternoon).—On the night of Dec. 9th one of our aeroplane detachments dropped many bombs on the railway stations and military establishments of Matigny, Ham, and Mons-en-Chaussée (all in the Somme region).

Dec. 11th.—During yesterday two German aeroplanes were brought down by our pilots on the Verdun front. One of them fell in flames near Brabant-sur-Meuse; the other crashed to the ground near Herméville (respectively north and east of Verdun).

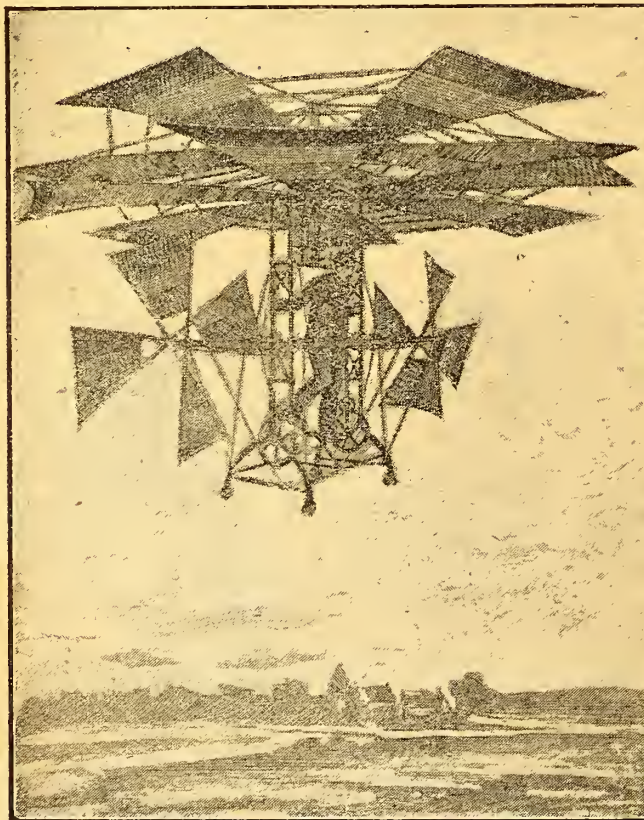
Our aviators fought several battles on the Champagne front yesterday, in the course of which Sgt.-Pilot Sauvage brought down his seventh German machine, which fell in flames south of Monthois (north of Tahure). A second enemy machine was brought down on the northern edge of the Bois d'Autry (east of Monthois).

Last night our bombarding aeroplanes dropped a number of projectiles on the enemy's munition dumps in the region north of Verdun. Several fires and powerful explosions were observed. Enemy cantonments at Romagne-sous-Côtes (north of Verdun) were also bombed.

GERMANY.

OFFICIAL COMMUNIQUÉS.

Dec. 8th.—In spite of the generally unfavourable weather great successes were obtained during the month of November by our Air Service. Our own losses of 31 aeroplanes in the West and East, in Rumania, and in the Balkans are balanced by the following numbers:—



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LE VELOCIPEDE AERIEN DE M. DELPRAT.

The old print from which the above picture was taken was found by a reader of "The Aeroplane" stuck on the wall of a dug-out in a trench taken over in France by a British battalion which relieved a French battalion. The interest thus shown in ancient aeronautical history by some unknown French soldier indicates the acute French mind. One is moved to wonder how this aged print found its way into a trench. Can any reader supply any information about M. Delprat and his experiments?

EXCEPT from Aircraft Manufacturers, Chief Stores Officers and Service Aerodromes, no further applications for the A.G.S. Book can be dealt with, as the whole of the present issue has been applied for and reserved. A further announcement regarding a new edition will be made later.

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The enemies lost in aerial battles 71 aeroplanes, 16 being shot down by gunfire from the earth, seven by involuntary landings—94 machines in all. Of these, 42 are in our possession and 52 were observed to fall down on the other side of the lines.

The aviators, both of the artillery and infantry, gained for themselves, by the very excellent execution of their important tasks, the recognition and confidence of the other troops. Headquarters highly appreciates their achievements.

DEC. 11th.—On the Verdun front during aerial fighting seven enemy aeroplanes were brought down by anti-aircraft guns and by our machines.

RUSSIA.

OFFICIAL COMMUNIQUÉS.

DEC. 5th.—Our aeroplanes made a raid on the village of Karamurad, north of Constanza. After throwing bombs and firing on an air-balloon the seaplanes returned safely.

DEC. 9th.—Near the town of Pelikany, south of Lake Drisviaty (south of Dvinsk), a German aeroplane was brought down by our machine-guns. In falling the aeroplane turned over and was slightly damaged. The aviator and the observer were captured.

DEC. 10th.—In the course of an aerial combat which took place in the region north of Dvinsk one of our aeroplanes came down in the vicinity of the Kolub Lake—25 versts north of Dvinsk. The machine was smashed, but the aviator escaped injury.

Another aerial engagement took place in the region of Illukst (north-east of Dvinsk), as the result of which a German Fokker was hit and fell to earth almost perpendicularly. Our aeroplane, after accomplishing its pre-arranged reconnaissance, returned safely, notwithstanding the fact that the machine was pierced with numerous bullet holes.

AUSTRIA.

OFFICIAL COMMUNIQUÉS.

DEC. 5th.—Italian air squadrons unsuccessfully bombed Dutoolje, Grossrepen, and Sesana on Dec. 3rd. Our aviators attacked the enemy, and forced a Caproni machine, with its four occupants, to land near Mayhinje. In this air fight Naval-Lt. Banfield and Lt. Bronowski distinguished themselves.

On Sunday evening one of our naval squadrons successfully bombed an enemy position near Doberdo, and returned safely, in spite of being heavily bombarded.

DEC. 6th.—On Dec. 3rd a Royal and Imperial aeroplane squadron dropped bombs on the barracks of Ciungi. Several hits were obtained without any damage being done to the squadron.

ITALY.

OFFICIAL COMMUNIQUÉS.

DEC. 5th.—Hostile aircraft dropped a few bombs on Adria and Monfalcone without doing any damage.

DEC. 7th.—Enemy seaplanes dropped bombs in the Aquileia district, killing a woman and wounding a child.

Our aeroplanes bombed the enemy aviation sheds, at Prosecco and the floating hangars on the Trieste pier with marked success as a reprisal. They returned safely to our lines.

DEC. 8th.—To-day two of our seaplanes carried out a raid on Trieste, dropping five bombs on the aeroplane sheds there. Our machines were fired on by anti-aircraft guns, but returned to their base uninjured.

* * *

Our war, according to those managing it, seems this last week to have become entirely an affair of the elements and the aircraft. Anyhow, as aerial dug-outs are not yet feasible, "copy" for communiqués seems assured for some time hence.

* * *

Capt. Ercole, who has got the gold "for valour" medal, seems to have obliged people to realise how incredible are the war conditions in Valona and Macedonia.

He got into a scratch when observing and shooting things down and about at 3,000 metres, saw both colleagues killed, and though wounded in the left arm, got over into the pilot's seat, brought the big machine down, and safely burnt her. After seven days in the wilds he got back to the Allied lines.—"In the sky of Zarnac, 13/10/16."

"In the (quieter) sky of Varese," Sub-Lt. Alfred Rossetti put up the world record for waterplanes to 5,400 metres in 81 minutes on Nov. 24th. I hear great things of the F.I.A.T.s. by the by.

Just passed a few days with an observer from the escadrille which did the official feasting of Capt. René de Beauchamp. A point for regret that he landed his Nieuport in the marshy country at San Dona instead of finishing the flight in St. Mark's Square, which is really quite close, and sounds better. Everyone was on the look-out, and had been for a day or two, but the mist and a natural desire to avoid the sea upset plans. He and his wife had some difficulty in visiting the Lagoons in quietness, and his anti-Boche gun caused more panic than was pleasant, in the absence of other luggage, when he first turned up at a well-known hotel. Let us agree with Swiss tales as to the effect of the six bombs left behind at Munich.

* * *

I understand that quite a revolution in the material and construction of sparking plugs is imminent. A mineral chiefly used for cooking utensils plays the first rôle in the new plug.

I see that the O.C.s. of the two Zepps you last bagged are much lamented according to Zurich. The one officer, an ex-N. German Lloyd man, named Max Dietrich, seemed especially valuable, and the other Nav. Lt. Frankenberg, was not unworthy of his hire.—T. S. HARVEY.

BULGARIA.

OFFICIAL COMMUNIQUÉ.

DEC. 8th.—Lake Tahinos. In this region our guns brought down an enemy aeroplane which was burnt.

BELGIUM.

It is reported from Amsterdam that on Dec. 5th three British aviators flew over Central Belgium, dropping bombs on railway junctions and military works near Brussels. The German artillery fired without effect.

* * *

It is reported from Flushing on Dec. 11th that two air raids on Zeebrugge took place, one in the morning, and one at midday.

The first raid consisted of 12 machines coming from the north, and continuous firing of anti-aircraft guns and heavy bomb explosions was heard. During the raid at noon the fog on the Belgian coast made the aeroplanes invisible, but observers saw the puffs of exploding shrapnel above the fog and heard bomb explosions and long-continued firing. The German coastal artillery is reported to have been in action incessantly since yesterday.

Another report states that yesterday English aeroplanes penetrated far into Belgium, bombing many important military works. They were seen, amongst other places, over Brussels, Oudenarde, and even Louvain. Railway traffic was partly suspended owing to the raids.

TURKEY.

OFFICIAL COMMUNIQUÉ.

DEC. 5th.—A British biplane was brought down by our fire on the Syrian coast near Remble (? Ramte, near Jaffa). The pilot and observer were taken prisoners.

AUSTRALIA.

It was announced by the Minister of Defence on Oct. 5th that the Commonwealth Government had decided to raise an additional squadron of the Australian Flying Corps for active service abroad. In addition, reinforcements for four squadrons would be dispatched monthly. Pilots would be selected from officers who attend the next aviation course at the Central Flying School, and from experienced aviators in possession of the aero club's certificate. Mechanics would be selected from all military districts after enlistment in the Australian Imperial Force.

Applications for vacancies in the corps will be received from fitters and turners, sail makers, riggers, cooks, coppersmiths, motorcyclists, motor mechanics, electricians, and wireless instrument repairers. Preference will be given to men already enlisted in the A.I.F.

It is understood that the new squadron will be trained at the Central Flying School, Werribee, Victoria.

TWO ACCIDENTS.

Their many friends will hear with regret of the rather serious accidents which Messrs. Harold Barnwell and Denys Chataway have sustained. Both aviators have been test pilots with Vickers Ltd. for several years, without mishap, and their accidents were both connected with experimental work.

Mr. Barnwell, who was injured on November 30th, is at present at Vickers' Hospital, West Hill, Dartford. Apparently Mr. Barnwell was leaving the ground on a large biplane, and when a couple of hundred feet from the ground something went wrong with the controls, which caused the machine to loop violently on its own account. Fortunately Mr. Barnwell switched off before the aeroplane hit the ground, and the machine struck right side up. Mr. Barnwell had his head very badly cut on the dashboard, but fortunately there was no concussion or fracture. Equally fortunately, although he broke the rudder bar with his feet, no leg bones were broken.

Mr. Chataway had a similarly fortunate escape. He came into the aerodrome on an experimental biplane, and was a bit short with his glide, owing to engine stoppage, with the result that the machine hit a raised bank. Mr. Chataway was badly cut under the eye, and it is feared that his sight is permanently affected. Mr. Chataway is in hospital at Fitzroy House, Fitzroy Square, W.

All will join in wishing these two old hands full recovery in time for Christmas.

FOR CHARITABLE PURPOSES.

Messrs. Chatto and Windus state that £50 has been remitted to the Royal Aero-Club's Flying Services Fund, and £50 to Mrs. Sueter's R.N.A.S. Comforts Fund, on account of the royalty on sales of the book of the War Letters of the late Flight Lieut. Harold Roshier, R.N., entitled "In the Royal Naval Air Service."

AGONY.

R.F.C. Officer, young, travelled extensively, is anxious to spend Leave among cheerful surroundings; moderate terms; immediate; genuine.—Box W. 42, "The Times."

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Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

SPECIALISM AND ART.

When an exceedingly able specialist sets out to tackle a big proposition after his own heart, it is all but impossible to stop him putting in all he knows in his fervour. The result is usually quite good, but terribly smart, yet somehow of the last convention, like a revue actress, as obvious and as inevitable.

An artist or a gentlewoman, on the other hand—are always originally *démodés*, sufficient yet restrained; anticipatory therefore. They always manage to keep the essentials, yet leave out the last trick that keeps off the devil. For yesterday's convention is the last iniquity. Better be dead than in the fashion, and damned as well.

The great artistic thing is to know what to leave out. And then, having made quite sure after a long time that there is nothing else, so to refine and shape the rest that it not only explains itself in its simplicity, but suggests all that was left out, and a good deal more that each beholder puts in for himself.

All of which—lest you might be groping—has its bearing upon aeromotor design. Which, to be really good, ought to be a new invention, at any rate, a new conception shaped round the essentials, every time. Wherefore my humble advice to young ambition is, make your first rough sketch of the idea, vague and ample as you like, and put it away for weeks. Better still, write a specification of it, and your necessities therein, not forgetting to include all the seeming impossibilities. Put it away and forget it. Take a fitter's or a riveter's job, work hard and commonly. It will all come right. Long before you need make the working drawings, the defects will have winnowed out. Because it will have had time for gestation. The elephant, remember, breeds but once in three years. But then—well, the result is a sure-enough elephant that may be the king of the keddah one day.

What the critics in their extraordinary language call "the values," means nothing more than the essentials appropriately treated. That is just why I am still sure of the consummate

artistry of the Duesenberg, than which I have seen no more appropriate aeromotor design from either side of the Atlantic. Also, why I cannot make up my mind as to the 300-h.p. Knox motor from Springfield, Mass., for which all the wealth of contemporary practice and refinement seems to have been ransacked. So much so, as to leave no doubt at all of Mr. Frank H. Trego's ability as a specialist.

THE LATEST EXAMPLE.

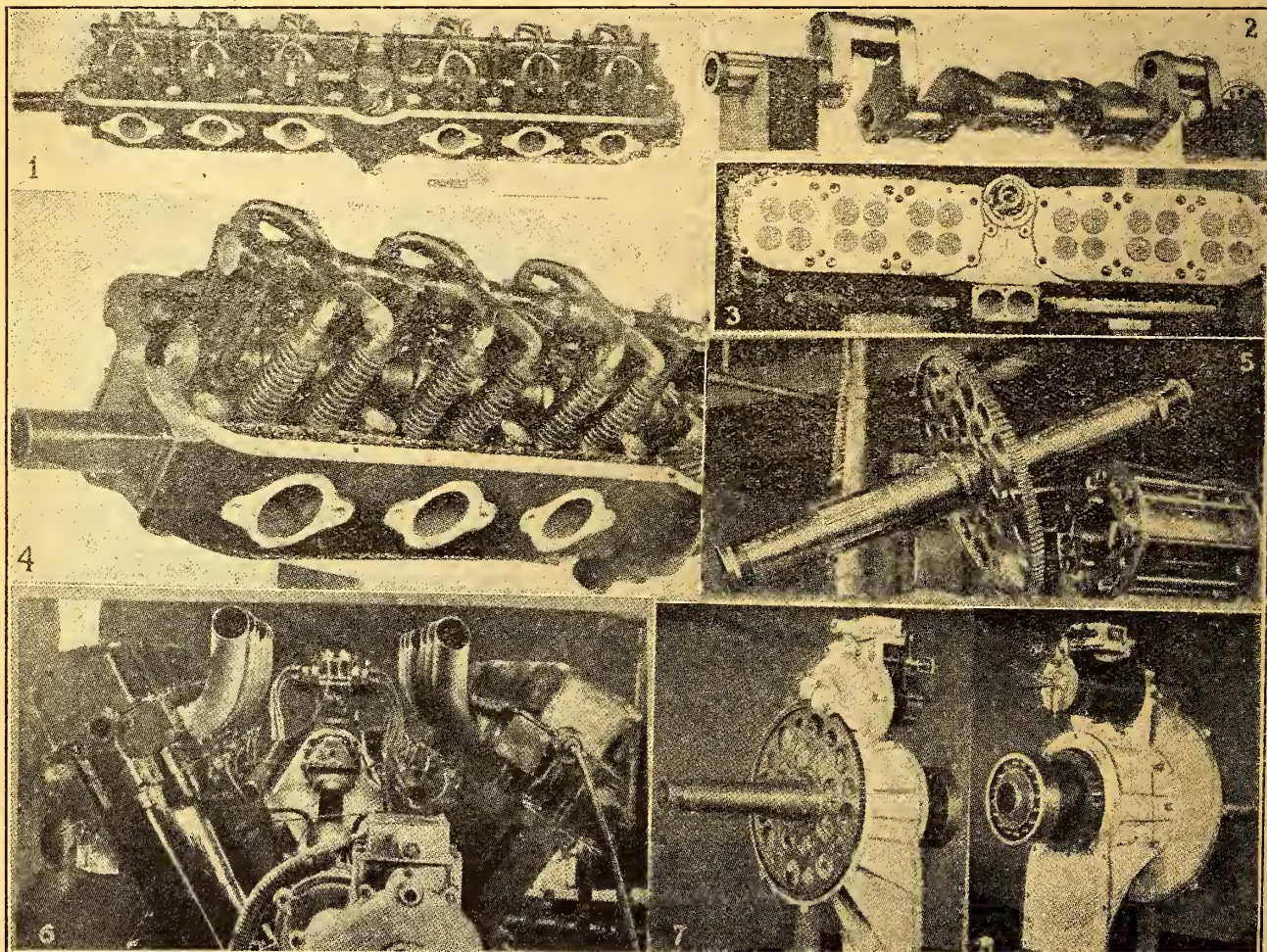
It is certainly America's latest, as it ran its tests no earlier than last November, on a 500-h.p. Sprague electric dynamometer, for eight hours, giving from 200 to 245 h.p.—at 1,400 to 1,600 r.p.m.—during the first seven hours, and then finishing with a strong gallop of 300 h.p. during the last hour. It showed no signs of overheating, though the blower broke down; in spite of which the air in the testing room never went above 78 deg. Fah., from 62 deg. Fah. at the start; and the water outlet temperature did not exceed 140 deg. Fah. Too cool, in fact, for a road racer; but perhaps not for aviation.

But, as it has been more or less specially designed to take a four-bladed 14-foot propeller with a 2,000-lb. thrust at 1,100 to 1,200 r.p.m., it seems evident that this Knox motor should more accurately be described as 245 h.p.—with a margin.

More, one cannot say; for though the bore of the twelve cylinders is $4\frac{1}{4}$ inches, and the stroke 7 inches for a total displacement of 1488.5 cubic inches, neither the compression nor M.E.P. have been so far stated to enable one to make any closer approximation. On the whole, then, from the showing of this test—which also made out a petrol consumption of a little over 0.6 of a pint per h.p.h. at half-throttle most of the time—the Knox motor appears to have made good and shown a good reserve of power; and to be likely to run without over-heating when all out.

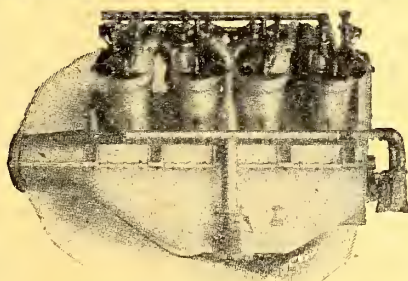
ITS EFFECTIVE MASS VALUES.

Unquestionably—as the illustrations show—the Knox motor is highly elaborated in detail. The founding obviously follows



THE KNOX 245-300-h.p. MOTOR. DETAIL VIEWS:—(1) Valve spring arrangement and camshaft; (2) Crankshaft; (3) Cylinder head—two blocks of three; (4) Close-up view of valve springs; (5) propeller hub and gear; (6) End view showing starter and ignition; (7) and (8) Two views of starter.

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American automobile practice, as the cylinder-heads are cast in a monobloc for each six, of aluminium alloy upon valve seatings of fine-grained cast iron. We, incidentally, should probably have made this combination in the less daring manner of machining those seatings and pressing or screwing them into place; no difficult matter since they are merely circular one-piece blocks, for each set of four valves per cylinder.

These castings, nevertheless, are well water-jacketed all round the actual seatings, and the inlet and exhaust passages, which are likewise moulded into the block; the aluminium comprising the jacketing wall for the most part. Composite construction, manifestly for lightness' sake, as well as the excellent radiation co-efficient of aluminium, has also been employed for the cylinders; which are cast in blocks of three; out of aluminium alloy for the mass, including the jacketing, with cast-iron liners one-eighth thick pressed in from the bottom. Better could hardly be. Every physical quality that makes for aeromotor endurance and trustworthiness is there; and the worst lubrication failure could only result in a burnt, yet removable, liner.

More, the construction is of the stiffest, and most readily lineable; and fewer bolts—only eight per block—are required for its crank-chamber anchorage. Inches are also saved on the mass-length, and a more even bath-like water circulation—yet with less weight of water—fewer connections and less resistance, than in unit-mounting practice. Also, the single-block casting for the entire set of six heads, if more cumbersome and requiring the more careful fitting and gasket-packing on the cylinder-blocks, does lend itself better than multiples would to the attachment—especially seeing that the medium for bolt insertion is only aluminium—as only sixteen nickel stud-bolts are needed, instead of at least twenty-four in the ordinary way.

AND CERTAIN DISADVANTAGES.

On the other hand, the defect of the system is this. The head block is detachable enough, and once off, the valves can be replaced, ground or what-not without reference to any other part of the motor, and with the least disturbance of the valve gear. For each cam-shaft and set of rockers would come away bodily with the head, and clear of the shaft-drive. This, being central as we see, is really better placed to balance, and disperse the thrusts on the cam-shaft bearings, and for aeromotors considerations generally, than in any other V-type design so far reviewed. But—here we have precisely twenty-four valves to each head-block. If one goes amiss, it must all come off.

Contrast this result with the peculiar appropriateness of the Duesenberg in the same detail. Or with the further possibilities of detachable seatings, for single valve removals and grindings, possessed by the Duesenberg. How much more does function determine the real values of design than feature, or even ingenuity. In fact, the chiefly meritorious ingenuity consists in adapting practice and detail to purpose, first and last.

So, too, with the disposition of the gas-passages. Particularly, I recollect recommending this very construction two years ago, if only to save manifolding and stabilise the mixture to its delivery: though this is the first instance since Bail's and Comilleau-St.-Beuve's introduction in which I have seen it adopted. But, as I said, for the efficiency of an unbroken circuit, it does demand a U-connection at each end—which may well embody the carburettor—to complete the *ceinture*—of a V-type. Yet, not only is this manifest essential absent, but the relation of the passages is wrong; outside the V, instead of inside it, and so bringing the carburettors and fuel-feed lateral—and liable to irregularity at every roll and dip—instead of along the central line.

There is positively no reason for it. That centrally-placed cam-shaft drive could no less have stayed where it is, and the induction-passage could have looped round outside it, and all the skew-gearing thrusts, with only the slightest of bends, that would not have checked the mixture-velocity a bit.

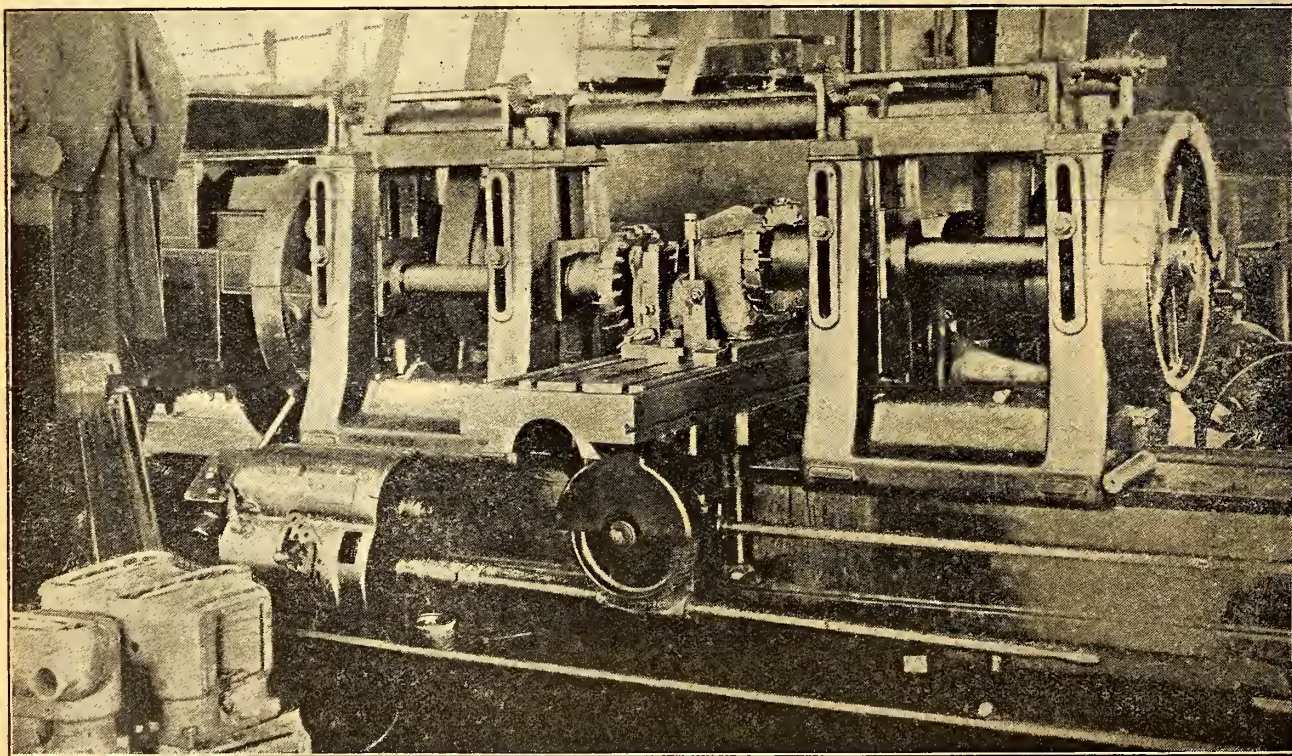
THE THERMAL EFFICIENCY QUESTION.

Finally, as to the cylinder-mass design, the ribbing of the trunks and bases, of course, helps the strength of the construction, but the lowering of the water-jackets so far down as an inch below the outstroke line is all against the maintenance of heat efficiencies, especially when the water entry is at the bottom. Why this point is not studied, and the circulation reversed, when all the physical conditions of aeromotor use, if only the essential cooling of valve-seatings—literally cry aloud for it; when, at this end there is heat to sell, burn or give away, I have ever failed to see. It is not as if there was anything experimental or unproven about the proposition. There is no type more difficult to cool evenly than the hammer-topped sort with T valve-pockets. Yet the best-known examples of that type, the Gladiator, Clement, Aster, White-Poppé—early model—and Bentley, were all cooled in that very way, with the entry above and the exit below, or on the opposite side. It was one of the chief reasons of their unflinching reliability.

THE VALVE-GEAR DETAIL.

The valve-gear design of the Knox motor is extremely well elaborated, for all that there is a lot of it, and that it is a bit top-lofty; though this last is an inevitable result of the general scheme. Adequate valve-areas must be obtained in combination with minimum lift somehow; since the higher efficiencies of small bore and long stroke, with the consequent added advantage of reduced mass-length, have been sought. So the best compromise—which again throws into contrast the Duesenberg-Delage-Lanchester gas-engine method and its inherent valve-area increase for nothing—is valve-duplication.

So, to get the appropriate curve of operation-thrust to suit the valve-setting, the clawed rockers have been curved right over, bell-crank-fashion, so that their lower ends may embrace the cam-



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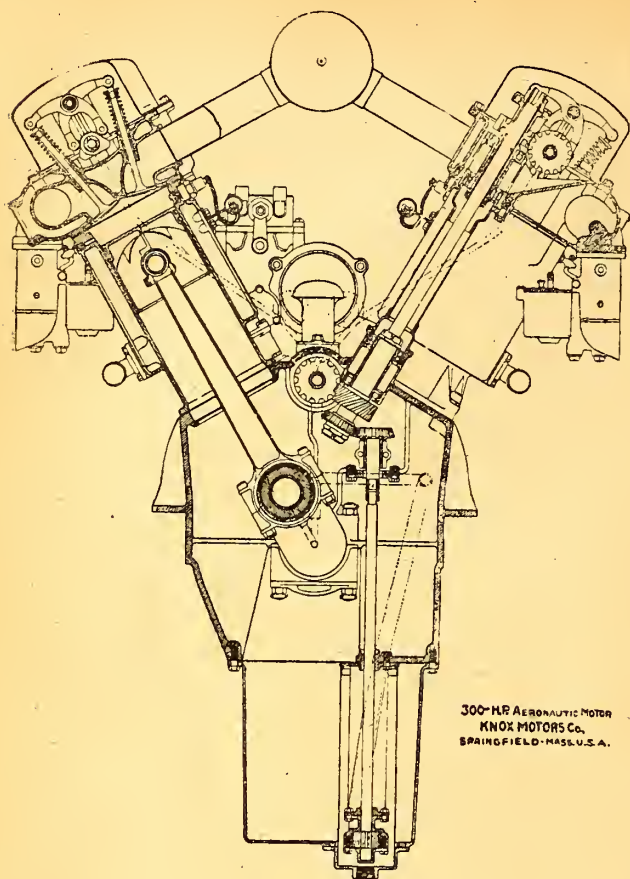
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shafts, and enable these last to be bedded down as low as possible. The result, as we see, is quite successful; and there is no encumbrance or crowding. The single pivot-spindle which carries the lot can be easily knocked out to bring everything clear; and the block formation of the heads, of course, lends itself to the familiar oil-tray encasement of the entire valve-gear, as seen on certain small French motors. But does it work out quite effectively from an aeromotor standpoint? All this encased mechanism is under force-fed lubrication. Which, of course, connotes overflow, if that overflow be allowed to exist. Yet we find it not only condoned, but provided for, in the drainage back to the crank-chamber from the ends and centre of the oil-tray. All very well. But the surplus oil will certainly leak through the edges of the casing, however well fitted. On the other hand, it would not have been difficult to effect this lubrication in the best possible way of cleanliness, simply by making conduits of the shafting drained into glanded return-pipes at all free ends. This, we remember, is more or less the Maybach way; and it does away with the need of trays and gear-casing, especially as protection from dust and dirt has not to be considered.

THE NEATNESS OF THE KNOX.

On the contrary, there are other parts in which encasement is necessary, if not vital. For magnetos, of course—though the Knox motor does not happen to embody them—and certainly for all gear-work, starting mechanism, and so forth. If possible, all such encasement had better be combined in a single piece of armouring. This has not only been done in the Knox aeromotor, but has been made use of further for purposes of support. For a single large and heavily strengthened alloy casting at the forward end of the motor, serves not only to enclose the whole of the electric starting gear mechanism on the propeller shaft, and to support the electric-starting motor itself—protecting all from moisture or flung pebbles—but it embodies the mass-support for the propeller-shaft and housing for all its thrust and running bearings; which lest they wear the alloy are provided with steel bushings. Similarly, at the rear end of the motor, a single

alloy-casting houses all the half-time and minor gearing, and also forms the support for the water-pump, air-pump, and lighting-generator set. Which last might, no doubt, very well be replaced by a current generator for wireless.

Thus, despite its elaboration, in some cases multiplication of detail, the Knox aeromotor design presents a remarkably clean and self-contained external appearance, that only a specialist could have imparted.

(To be continued.)

AN ELDERLY SCHEME FOR A BIG SEA-PLANE.

The following amusing letter with the accompanying sketch has been received from an N.C.O. of the Army Ordnance Corps, who, though he is in no way professionally concerned with aviation, is a keen student of aeronautics and is blessed with a sense of humour. He labels his machine "The Flying Turnip," a name which might be applied to some of our own super-sea-planes:—

Sir,—I must not encroach on your valuable time, but I really cannot resist sending you the two enclosed sketches—for no other reason than that they might interest you as being an amateur idea of the future "trans-?" aeroplane, and drawn some eighteen months ago at that.

You will, of course, give them all due consideration before—er—condemning them, and I think you will appreciate some of the construction details shown. In one of your numbers I read some time ago of an aeroplane being constructed by the Curtiss Co. which, coincidentally, seemed to fit in nicely with my drawings, although, as I have already stated, my sketches were made long before the article appeared. However, you must judge for yourself.

A few points I considered were as follows:—

(a) Although the "nacelle" (I believe that's the correct term) seems bulky it would not necessarily follow that it was far too weighty, as, you will notice, I have specialised on saloon-structure, which if taken away would leave just engine-room and tank.

(b) The milk-churn arrangement from which the propellers "emanate" is rather faulty, but is meant to represent a chain drive from a shaft underneath the lower plane—all covered in, of course.

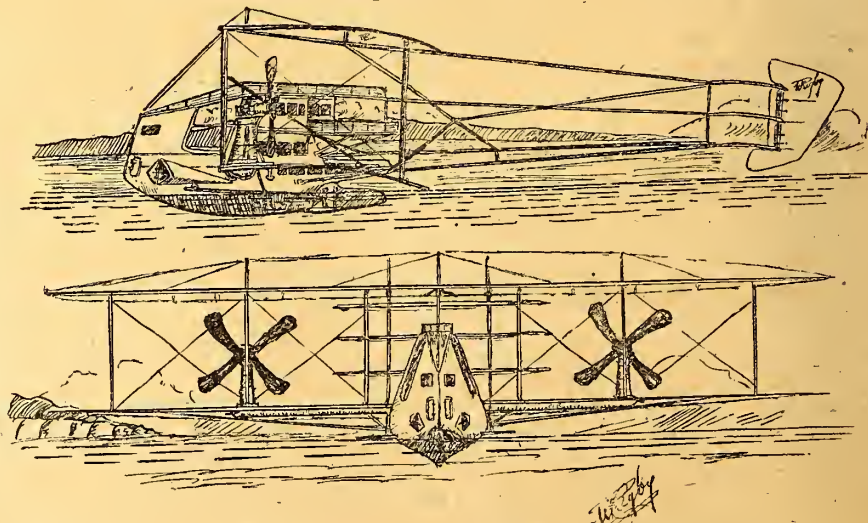
(c) The frame is of an entirely original extra-strong idea of mine—the three lower bars being worked into the nacelle. The tail is a triplane arrangement and holds a double rudder.

(d) The triangular shaped openings on the front of the nacelle are in conjunction with the cooling of the engine.

The whole machine would be assisted to rise from the water by means of two hydroplanes working in a like manner to those of a submarine. I have not yet heard of this idea being tried, but suppose it will have been.

By the way, you must not miss the small motor for driving the machine in the water should she get into difficulty when at sea! I am getting rather "Jules Vernesified," so I had better pull up.

Hoping I have not bored you as I know it is not really business to write in this fashion, but taking the advantage as a reader of your paper—and being more than ordinarily interested in these things.—W. R.



W. R.'s Early Design for a Big Seaplane.



ARMSTRONG, WHITWORTH

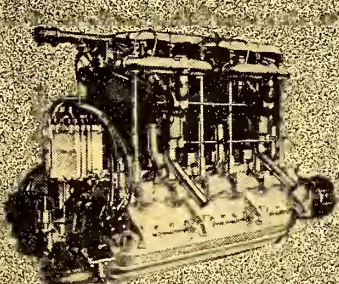
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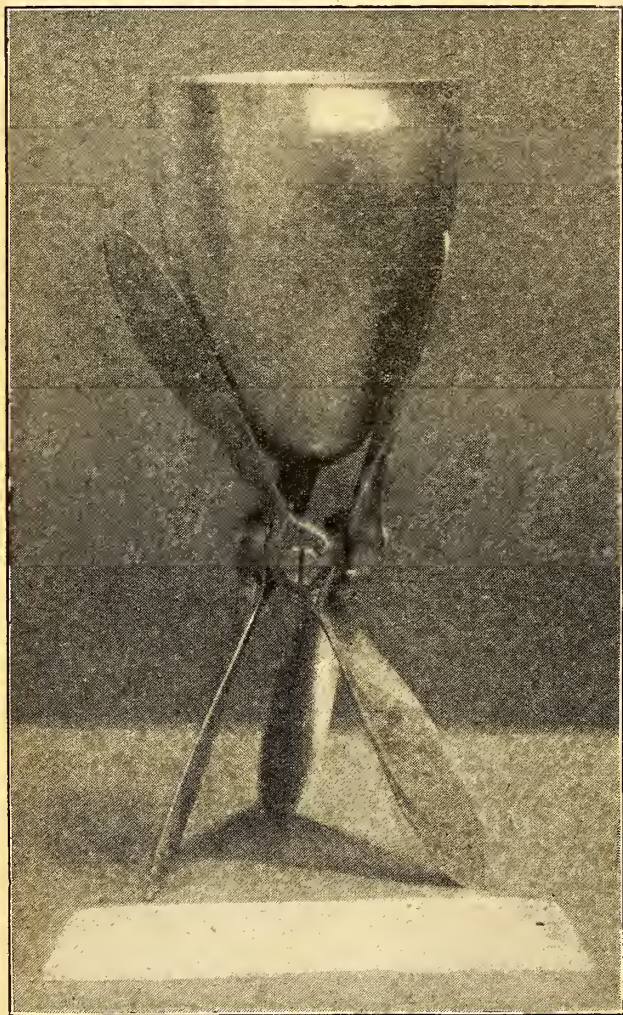
There is a sort of connection, more mental than real, but no less certain, between motor cars and aeroplanes, and all thereto belonging. That is why, I suppose, one naturally reverts to the substantive conditions of the one, in reviewing the possibilities of the other. There is also another, apparently more remote, but actually very direct indeed, between any aeroplane proposition and any yacht-building yard, where all matters of the finest and strongest rigger's craft are as daily bread.

Yet, the motor connection, more superficially apparent, counts the more. So—even remembering Max Richard's in the Rue d'Anjou—one admits the claim of a certain garage in Soho—where, by the way, they built a tandem monoplane with a two-stroke motor five years ago—to be the largest in the world. To-day it would make a no less excellent aeroplane factory, within its limits. Close up to Regent's Park, as everybody knows, is another huge motor-depot that might be turned to the same account if it were not much more useful in its original capacity. And—there are others. For London is a thousand years' accumulation of the unexpected.

But the finest garage—in the sense of pure elaboration for the needs of the costly car and its driver—that I had ever seen before the war was in a by-street in the heart of Westminster. Literally, it wanted nothing. Never was a racing-stable more secure, and I remember none better appointed for its occupants—I was going to say charges.

Came then the war out of a clear July; and at once all these costly creations shed their ornamental atmosphere and function, and vanished to the realities of service, not to say slavery, and to make the best of their luck in the way of shelter; shivering, no doubt, in their smeared satins and robbed of their jewellery. As mostly happens to the hitherto ineffective, until they buckle to realities.

Their old abiding-place nevertheless remained, an empty shell



The "Lewis Cup"; made from the aluminium nose-piece of an aeroplane silencer and certain model propellers. This trophy was the prize in a football match between the Boulton and Paul "Aircraft Works" team and the "Components" team at Norwich. The "Aircraft Works" team won by eight goals to one.

ready to be re-fitted with any immediate service-proposition. But it is given to few to see fulfilment in emptiness, and creation in chaos, so it remained empty and lost to use until a few months ago; when suddenly, it became Nestler's, Limited—for their headquarters at least—merely within its own limits of No. 9, Greycoat Street, S.W.

Fortunately, those limits are peculiar to itself, and not to the firm which already has outgrown them, and made provision elsewhere; and will again anticipate its own growth in the same way. Yet when, not fifty yards away there are two acres of somebody's land, naked to the sky—and have been these five years, it seems strange that a State which can commandeer ships wholesale and appoint managers for their use, seems yet unable to commandeer unused land in the heart of a city, and appoint the nearest war-munition producer to employ it as best he can, upon the mere obvious evidence shown that he can do so. For when no other employment exists to be prejudiced or hurt, compensation apparently could soon arrange itself afterwards. The autocrat whom we most need—or half-a-dozen such—would do these things; but not a gaggle of lawyers, ever-anxious to preserve dead or dormant interests before living needs and quick realities.

This, by way of present explanation why No. 9, Greycoat Street is not also a great many others in the immediate Elverton Street and to the bare edges of all roundabouts. For why it should be, one needs only the evidence of the use that is being made of No. 9 itself already, and the fact that the whole of its possibilities are not yet exhausted. As for instance, there is one gallery all along the middle of its two-hundred foot length. But as fast as they can be built, there are going to be two more, one on either side. Then, with all detail production and constructional work that can be, cleared out elsewhere, this one-while garage should be as fine an aeroplane erecting and fitting shop as is in all London.

As it is, what used in other days to be the repairing shop fronting Greycoat Street—and what a chauffeur's paradise it was!—is now a remarkably busy and well-fitted sheet metal and shear-work shop generally. But excellent of their kind as the machines and plant for this work are, their lay-out is still better. Which is about the strongest point of any productive proposition. In a new and very much hurried industry such as aeroplane building, one does not expect the science of lay-out—which is really the essence of competitive production when it comes to a show-down—to have been very closely studied, if at all. Yet in this instance, it certainly seems to have arrived all the same, from the fact that although at least a hundred men are working in this comparatively small shop, they are not crowding one another, nor their work, nor the machines: and there is still plenty of room left for the material in hand and shortly to be worked up.

It is system that tells; that counts for success. even by inches at a time for the moment, to spread forth into great productive results as soon as the physical pressure of space is released. Never more so, than in the kind of system that can be seen behind the apparent makeshift of the moment.

That very practical makeshift, however, one sees in the employment of one section of the existing gallery—which cannot yet be used as a whole, since the other two galleries that are to complete its department are not yet built—as a drawing office. Now, next to clear and evenly distributed light—which naturally exists in this case, coming from both sides and from the glass roof immediately overhead—there is no greater essential of a drawing office, large or small, than remoteness from actual manufacture.

First and last, be it remembered, the work here is done on the nerves, the finest of it. So there must be no jarring noises, nor least of all, any vibration, to distract the development of a drawing; and of course, as little risk of interruption as may be. Those are the fundamental hindrances to production: for the mere carrying of the finished drawing or blue-print half a mile to the shop if need be, is no hindrance at all.

At any rate, in this case the result seems to have been successful, for the young women who undertake most of the draughtsmanship do not seem to suffer from harassed nerves. Quite otherwise, as the quality of their work shows.

All this, however, is mostly for the preparatory rather than the actual stage of aeroplane production; as one sees in the main building below. A few wood-working machines—planes and spindle-cutting mills—have already been installed for the needs of the initial output. The tables for all sorts of jigs are also being built for extensive production elsewhere as well. But most of the space at present is occupied with what has hitherto been the firm's chief contract business, but later on will only be a branch, conducted elsewhere; this being the construction of hangars of the largest size, in sections which can be rapidly built up and detached, for military use.

These, of course, are bulky enough, a pile of a dozen or so taking up quite as much floor space as an average sized aeroplane. But there are still so many of these piles, and space again for so many more, that one sees at once how many aeroplanes might easily be erected at a time, or even partly built in detail, if the whole of the space were available for that single purpose.

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That it will be before long, is already manifest in certain—present—examples; one of which is more than usually promising. The other—which I understand to have been less their production than their financing—is more or less a copy of a Voisin pusher gun-bus. The construction—which was so far theirs—is quite of the soundest. The design, on the other hand, is Voisin, with certain differences. For instance, the chassis in outline and build generally, is Voisin; but the suspension *en culotte* is in the manner of A. V. Roe and a few others; the *culotte* or sleeve-casing in this instance being well stream-lined to good curves.

So far well: and no fault can be found with the plane-construction or the bracing and rigger-work generally. Which is all precisely as from the Voisin factory.

On the other hand, the design of another machine now completing its assembly—which is the work of Messrs. Nestler's own designer—is distinctly above the average of the type, albeit the practical standardisation of the type, leaves no particular scope for originality in the mass. The chief impression one gets is that the fuselage is roomier than most others, forward, as much so as any two-seater; none the less its longitudinal curves have been beautifully faired to the tail; which, however, is one of the narrowest of the non-lifting type.

Details too—so far as may be learned—are interesting. Their probabilities, to my mind, are the more likely to be fulfilled, as they appear as the result of after conclusions from a completed example built by eye seamliness and handfairing, rather than from deliberate calculations beforehand. The chance taken is better, as a rule, than the over methodical certainty. But there have been no chances taken on the material or the construction. Which is one fundamental reason among others why, starting as they have, with the system they manifestly are masters of, added to their progressive intentions, Nestler's, Ltd., should soon rank among the most important firms in the aeroplane industry. They have at least the inherent quality of success, as is evident from the way they have set about winning it. J. DE H.-S.

SPONTANEOUS PETROL EXPLOSION.

It was stated in an article in some paper recently that by pouring gasoline through a chamois in a funnel electricity was generated, set fire to the gasoline and severely burned a man pouring the gasoline.

The possibility of this occurrence has been demonstrated. An explanation is given as follows: Let us assume that you are about to fill your tank. The funnel is in the nozzle. A chamois strainer is in the funnel. The gasoline is turned on and as it pours through the chamois it generates static electricity. Static electricity may be defined as electricity that is at rest. Static electricity, as we have said, is now in the funnel. The funnel is charged with it. So long as the funnel fits securely into the mouth of the tank, this creating a "ground," you are safe. Now, let us assume that you did not allow the funnel to rest inside the nozzle of your tank, as the gasoline seeped through the chamois skin. Either yourself or some one else held the funnel in mid-air, or it rested free of the sides of the tank. No "ground" was formed. We have seen that gasoline, a volatile substance, passing through chamois forms static electricity, which charges the funnel. When the amount of electricity is sufficient to produce a jump spark, that spark jumps to the nearest "ground," which is your tank. In doing so it must pass across the opening between the end of the funnel and the edge of the tank through which gasoline vapour is rising. The moral to be derived from this article is this: Do not put gasoline through chamois skin. But if you will insist on taking chances be sure that you have a "ground" on it, by seeing that the funnel touches the opening of the tank. Be doubly sure that you take this precaution.

AIRCRAFT FILMS.

A new series of war films exhibited not long ago at a private view at the West End Cinema showed the work of the seaplane-carrier, "Ark Royal," now operating on the Aegean.

The whole of the process of launching a seaplane is displayed, and the cinematographer has accompanied the pilot on a long flight and photographed the country over which he passed. Thousands of feet below are shown the closely packed houses of the Greek villages. A flight is made in a small airship—or "Blimp." The "Blimp" is taken from its shed and harnessed up for its trip. The picture takes the onlooker over Balkan villages, and shows the wild country where our men are fighting in the Near East.

The inflating of a sausage balloon, with views taken from the observation car of shells bursting on the Bulgarian lines, form the subject of another film. The pictures, which are to be released some time after the first week in December, are published by the Topical Film Company.

A WEDDING.

GRIMMER—HOWES.—On Thursday, Dec. 7th, Robert P. Grimmer, the son of the late Robert Grimmer, of Wisbech, was married to Ida Mary Howes, daughter of William Joshua Howes, of Norwich, at St. Martin's Church, West Ealing, by the Rev. Chas. Serjeant, M.A.

THE AEROPLANE SPEAKS

BY

H. BARBER, A.F.Ae.S.

(Captain R.F.C.)

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PROLOGUE.

PART I.—THE ELEMENTARY PRINCIPLES AIR THEIR GRIEVANCES.

" II.—THE PRINCIPLES, HAVING SETTLED THEIR DIFFERENCES, FINISH THE JOB.

" III.—THE GREAT TEST.

" IV.—'CROSS COUNTRY.

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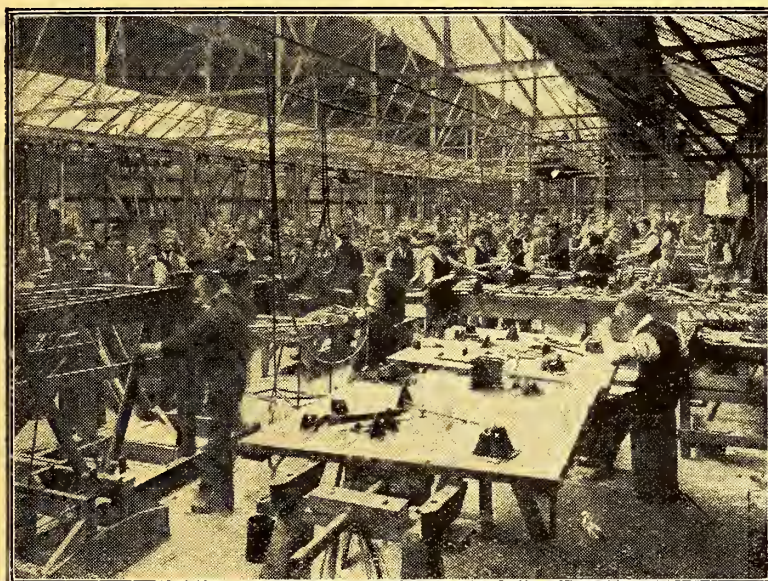
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ANSWERS TO CORRESPONDENTS.

[Enquiries should be addressed to "The Editor," THE AEROPLANE, 166, Piccadilly, W.]

B. M. (Tonbridge).—The subscription to the "Aerial Age" is 5 dollars (about 21s.) per year. Subscriptions should be sent to Foster Buildings, Madison Avenue, and Fortieth Street, New York City, U.S.A.

It is obviously impossible to publish in war time dimensions and particulars of performance of modern aeroplanes, even when they do not happen to be of any particular use, as they would give the enemy, at any rate, some indication of the trend of design in this country.

E. O. (Easington).—You should apply for enlistment in the R.F.C. at the head recruiting office at Durham. Your haulage engine experience should be of assistance, as it implies a certain amount of mechanical knowledge.

Thanks for the particulars about the Hun airship. Every anti-aircraft battery within 50 miles of a fallen airship thinks it is responsible for the job, but it is not permissible for one to say in print exactly to what extent the anti-aircraft guns have been responsible for bringing down enemy airships.

H. W. (Walsall).—Thanks for the suggestion. There does not seem to be any particular object in taking up "a kind of torpedo" to discharge into an airship so long as it is possible to use the apparently very efficient weapons now in the possession of the Flying Services.

The number of people who have invented methods of destroying airships lately is simply amazing, and most of them are merely wasting their time in writing about their inventions to people who already have as much work as they can do. Further, unless it is certain that the proposed method of airship destruction is very much better than anything at present in existence, it is not worth while troubling about it.

It must be remembered that the chief difficulty about airship-hunting is for the pilot of the destroying aeroplane to find the airship in the first place. Once the airship has been seen, its destruction is now comparatively easy. What are needed, if anything, are not methods of destruction, but methods of discovering precisely the whereabouts of the airship.

R. M. W. (Didsbury).—The book you ought to get about the general control of aeroplanes is Major Gill's book, "The Flyer's Guide" which sells at 3s. 6d. This is quite the best thing that ever happened for an absolute beginner. As regards regular military duties, you ought to get the Field Service Pocket Book, and

anything you can lay your hands on in the shape of elementary military books. These are sold by all better class booksellers.

FEMINA.—It is hoped that considerably more space may be devoted in future to work done by women in aircraft factories, and if any of our feminine readers wish information or advice on any subject concerned with aircraft they may be sure that their communications will be dealt with to the best of the ability of the Editorial staff.

G. A. C. (Kent) sends the following horrible conundrum:—

"Two aeroplanes are travelling at a continuous rate of 2,000 ft. per second in a direct line in the same direction. They are at a distance of 500 ft. apart. The pilot in the rear aeroplane has a rifle with a muzzle velocity of 2,000 ft. per second.

"Assuming that the pilot is a dead and true shot, would he be able to hit the pilot in the leading aeroplane, and, if so, how many seconds will elapse before the object is hit? Please give reasons, if in the affirmative."

First of all, a speed of 2,000 ft. a second means approximately 1,300 m.p.h., so that the assumption that there are two aeroplanes travelling at 2,000 ft. per second may be washed out.

However, leaving the speeds of the aeroplanes themselves out of the question, there does not seem to be the slightest reason why the gunner in the rear aeroplane should not hit the pilot in the leading one, provided that the leading aeroplane is not a "pusher"—in which case he would probably hit the engine instead of the pilot.

The muzzle velocity of the gun is only affected by the speed of the aeroplane to the extent that the speed of the aeroplane through the air is added to the muzzle velocity of the bullet, and, therefore, the head-resistance of the bullet is increased by that amount. For instance, a machine travelling at 100 m.p.h. is doing roughly 150 ft. per second, so that a bullet leaving the muzzle of a rifle or machine-gun with a speed of, say, 2,000 ft. per second would actually be travelling through the air at 2,150 ft. per second. Its actual range over the ground would, therefore, be increased to some slight extent.

As the other aeroplane is supposed to be flying at the same speed as the one from which the bullet is fired, that additional velocity would not affect the time which the bullet would take to reach its objective, and it is just possible that the extra head-resistance caused by the extra speed through the air might slightly increase the time which the bullet would take to overtake the leading machine.

This is rather a pretty question for experts in ballistics to work out. Perhaps someone would oblige.

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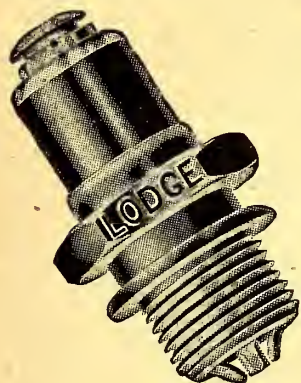
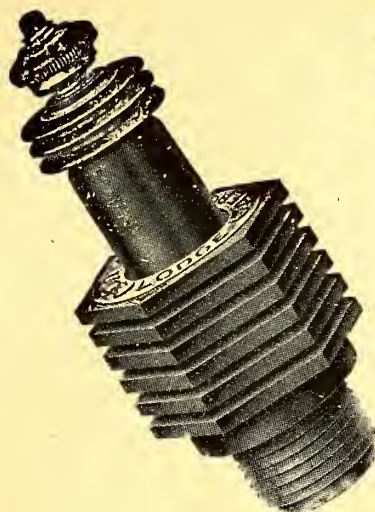
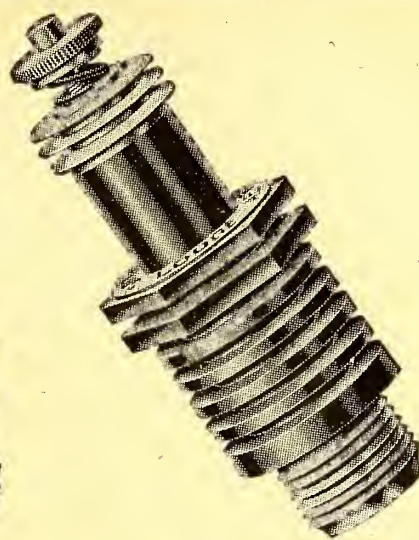
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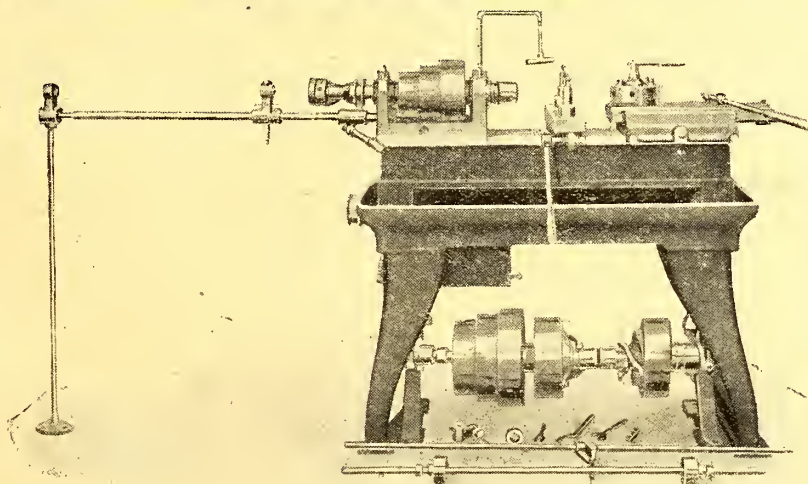
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J. J. (Farnborough).—Applications for commissions as Stores Officers in the R.N.A.S. should be made to the Air Department, the Admiralty, London. Such commissions are supposed to be chiefly given to men with engineering and mechanical experience, and it is stated that preference is given to men not fit for general service.

E. E. H. (Kettering).—A book which deals with modern aeroplane design in a non-mathematical sense, but which is quite up to date, is "Aeroplane Design," by Capt. F. S. Barnwell, R.F.C., 2s. 6d. net. An Appendix on "Stability," by Lt. W. H. Sayers, R.N.V.R., explains the phenomena of "spinning" and such happenings in simple language.

Capt. Barber's book is now ready for consumption, and the announcement of its publication is made in this week's **AEROPLANE**. "All the World's Aircraft" is an elaborate aeronautical book of reference. There is a great deal of useful elementary information in "Aircraft in War and Peace."

The standard work on aerodynamic science is "The Resistance of the Air," by M. Eiffel, price 2 guineas. Any of these books may be obtained from the William Dawson Publishing Co., Ltd., Rolls House, Breame Buildings, Chancery Lane, E.C.

A. E. K. G. (North Kensington).—Applications for commissions as Equipment Officers should be addressed to the Department of Military Aeronautics, Adastral House, Victoria Embankment. Those accepted are first graded as third-class Equipment Officers, and receive 12s. per day. Mechanical and engineering experience are the chief qualifications for the position.

R. R. (Edgware Road).—1. There is nothing to prevent a South African from obtaining a commission in the British Army. 2. R.F.C. Cadet's uniform consists of an ordinary officer's tunic without any badges or facings, and the usual R.F.C. "Glengarry" cap. 3. £10 is the allowance made by the War Office to cover the cost of a Cadet's kit. 4. A secondary school education is no disqualification for a commission in the R.F.C., if everything else is up to the standard. 5. Your experience as assistant aeroplane inspector might be considered a recommendation. 6. In the best society it is not considered good form to call oneself esquire on an envelope.

W. M. J. (Southport).—There is really nothing novel about having a forward elevator, such as you illustrate in your sketches, because all the old box-kites had them, and the "long-horn" type of Maurice Farman has them still.

Any modern aeroplane can be so adjusted that it will glide at an angle of approximately 10 degrees, and, as a matter of fact, there appears to be always a little bank of thick air close to the

ground into which the machine dives, and if it be gliding sufficiently slowly this seems to have a tendency to "pick it up" just before landing. Your method of altering the dihedral angle of the wings would complicate the machine horribly, and would add a lot of mechanism which the modern aeroplane cannot afford to carry. Such a machine as you illustrate would be frightfully clumsy to steer, although it might travel all right in a straight line, and the 7-plane in tandem machine, shown in another sketch, would be utterly inefficient, because the leading planes would spoil the lift of those following them. It seems, therefore, that there is nothing to be got out of any of your ideas which has not already been done very much more efficiently in existing machines.

E. W. N. (Small Heath).—Candidates joining the Officers' Cadet Corps, R.F.C., receive a kit allowance of £10, with which to buy the necessary clothing during this stage of their career. They also receive a nominal rate of pay. It is possible to convert the cadet's uniform into an officer's uniform in the event of the cadet receiving a commission.

The cancellation of commissions on probation may be due to various reasons. Either the probationer shows no aptitude as a pilot, or else perpetrates unjustifiable smashes, or he may be considered not likely to be efficient as an officer. The best way to ensure the confirmation of a commission is for the probationer to keep his eyes open and his mouth shut, to learn all he can, and to behave like a civilised human being.

G. R. H. (Ramsgate).—A glossary of aeronautical technical terms in French, English, German, Italian and Scandinavian is published in "All the World's Aircraft," which may be obtained price £1 1s., from the Wm. Dawson Publishing Co., Ltd., Rolls House, Breame Buildings, E.C. Of course, the glossary only occupies a very small part of the book, which contains information concerning the Flying Services of every country of the world.

B. W. T. (London, S.W.).—Many readers have suggested that it would improve **THE AEROPLANE** if the advertisements were printed on pages entirely separate from the reading matter. The reason for not doing so is primarily that in any technical journal which is over about five years old the advertisements generally make considerably more interesting reading than the reading matter itself, and in any case the advertisements form practically a history of the growth of the particular industry with which the journal is concerned, so that the advertisements are printed in such a way that they cannot be cut out in binding.

There is further the reason that it is impossible to avoid putting advertisements on reading matter pages in many instances, and if the rest of the advertisements were printed on separate

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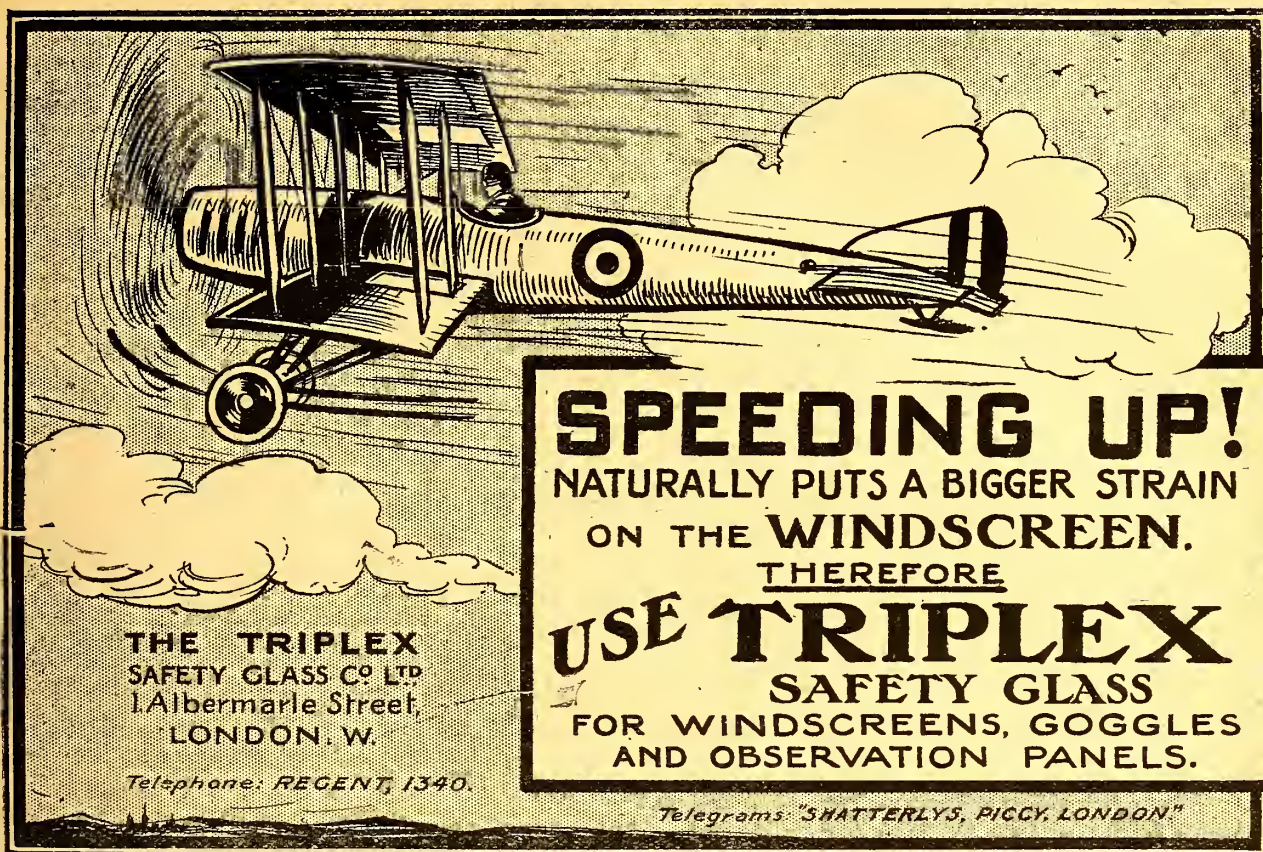
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pages and cut out by foolish bookbinders, those advertisements which appeared on reading matter pages would be left in the bound volumes, and so destroy the uniformity of the volume.

Thirdly, there is the very important reason that a large number of advertisers insist, as a condition of advertising, that their advertisements shall appear on right-hand pages facing reading matter, and the only way to fulfil this condition is to print the advertisements as they appear in THE AEROPLANE.

C. A. F. (Liverpool).—The tandem aeroplane may present apparent possibilities, but it would have to be specially designed from start to finish before it could hope to compete with present machines. It is improbable that an ordinary tractor machine with two sets of planes one close behind the other would be an aero-dynamic and structural success. In the first place the front set of planes would send a powerful stream of disturbed air into the back set and this would create complications in design. The propellers would also interfere with one another as the rear propellers would have to work in the slip stream of the front propellers, and although this disadvantage could be reduced it could not be entirely eliminated. Tandem planes placed close behind one another would also make steering extremely difficult, especially as the main load would have to be distributed over a long distance longitudinally and powerful moments of inertia would have to be overcome. There may possibly be room for a specially designed tandem aeroplane when great weights are to be lifted, but as a matter of fact the multiplane with three, four, or five, superimposed wings presents more immediate possibility than the tandem biplane.

THE EAGLE AND THE BRITISH DOMINIONS.

Long before the Government awoke to the risks incurred from Zeppelin and aircraft raids, the British Dominions General Insurance Company was making known its readiness to insure the public against damage by bombardment from above. Its foresight was in keeping with the spirit which has carried this young company into the front rank of insurance offices doing all kinds of business, except life.

The announcement that the British Dominions is to link up with the Eagle, which is wholly a life office, is therefore of peculiar interest. The Eagle has age and important connections; its flight in recent years has not perhaps kept pace with that of some others, but it has always been regarded as sound of wing and limb, and it has refused some tempting offers of marriage.

It is another proof of the enterprise of the British Dominions

that it has induced the Eagle to join forces, and these two working together will undoubtedly make a fine company. The premium income of the two offices amounts to £1,750,000; helping each other as they will, the £2,000,000 mark should soon be reached. Insurance plays so great a part in the national life to-day that any development which adds to its strength and dignity is to be welcomed. Established under deed of settlement in the nineteenth century—to be precise, in the year 1807—the "Eagle" was incorporated under the Companies Acts with unlimited liability in 1897.

The capital of the company is £1,678,675, divided into 335,735 shares of £5 each, of which 10s. has been paid up. The funds of the company exceed £2,000,000.

The British Dominions General Insurance Company, Limited, was established in the year 1904, and has an authorised capital of £1,000,002, of which £775,014 is subscribed, £380,292 being paid up and £394,722 uncalled. The preference capital amounts to £123,000 and carries a cumulative 6 per cent. preference dividend. The funds of the company exceed £1,700,000.

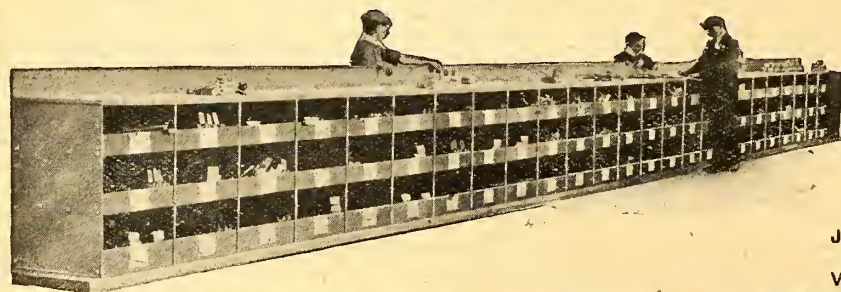
The title of the amalgamated company will be the "Eagle and British Dominions Insurance Company, Limited."

Mr. E. M. Mountain, the present managing director and underwriter of the British Dominions Company, will continue to act as managing director and underwriter of the company after the amalgamation, with Mr. H. H. Merriman as assistant underwriter.

Two directors of the Eagle Company, viz., Mr. Horace Peel (the chairman) and Mr. G. J. Fowler will join the Board of the amalgamated company. They and the remaining members of the Eagle Board, viz., Mr. C. W. E. Loder, the Hon. Sir Sidney Greville, Lord Duncannon, Mr. G. R. Jellicoe, Major Scott, Mr. Cyril Jackson, and Mr. F. M. Elgood, will constitute the West End Board of the amalgamated company. Mr. F. B. Galer, M.A., F.I.A., the present manager and actuary of the Eagle Company, will become the manager of the life department of the amalgamated company, with Mr. D. M. Carment, B.A., F.F.A., as actuary, and Mr. N. J. Carter, F.I.A., assistant actuary. Mr. S. A. Bennett, F.C.I.I., will continue as manager of the fire department. Mr. D. M. Carment, B.A., F.F.A., as manager of the indemnity department, Mr. E. E. B. Eldridge, F.S.S., A.I.A., as manager of the accident department, Mr. S. Holland as manager of the marine department, Mr. A. L. Royle as manager of the motor insurance department, and Mr. A. F. Shepherd as manager of the organisation department. Mr. John Gardiner, A.C.A., will be the secretary, Mr. James Worsfold, F.C.I.S., will be the

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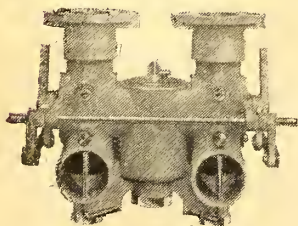
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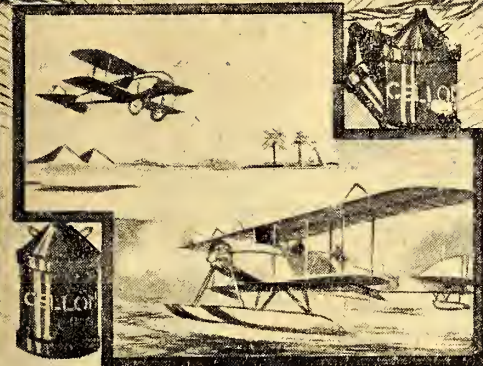
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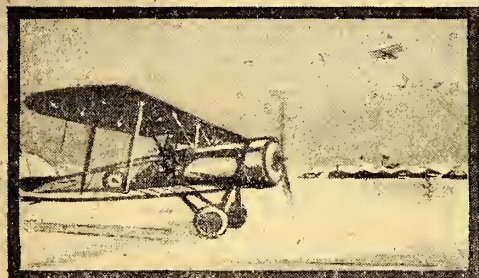


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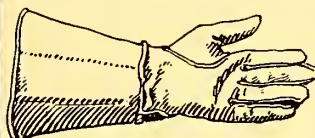
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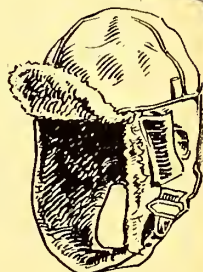
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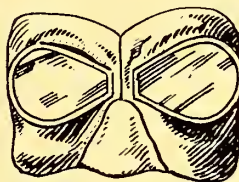
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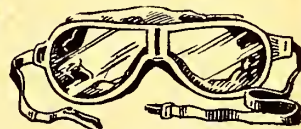
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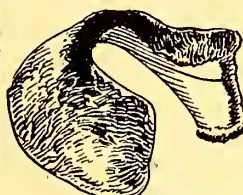
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assistant secretary, and Mr. J. E. S. Kemp (the present secretary of the Eagle) will be secretary of the West End board.

The British Dominions Insurance Co. has in the past been famous for its "All In" Policies, which for a small premium cover a great number of risks, many of which are not covered by other policies. These policies have been so popular in the past that the new amalgamation will continue their issue in the future.

THE FIGHTING INSTINCT.

A class in an elementary junior school was recently asked to write an essay on a trip in an aeroplane. The best effort was produced by a youngster of eight, who turned out the following literary work:—

TOM WRIGHT.

6/12/16.

COMPOSITION.

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The pugilistic instinct develops at an early age, and does not seem to decrease as time goes on, judging from what is happening in Europe at the present time!

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The National Aircraft Manufacturing Co., of Printing House Yard, 15a, Hackney Road, London, N.E., are now in a position to undertake all kinds of fittings, plate work and welding for aeroplanes, and would also undertake the construction of complete planes, using their own fittings passed by the A.I.D.—thus turning out the complete job without troubling the main contractor for fittings. Inquiries for work of this nature will receive prompt attention.

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Messrs. Bale and Co., of No. 1, Grand Parade, High Street, Croydon, announce that they are in a position to quote for steel tube bending, making lap joints in tubes, and for general tube work for aircraft. They have for a considerable period been bending tubes for tail planes, elevators and rudders of aircraft, and are prepared to undertake further work of this nature. Inquiries from the trade are cordially invited.

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COMPANIES DELETED.

From the "London Gazette" of Nov. 17th:—

JOINT STOCK COMPANIES.

Notice is hereby given, pursuant to Section 242 (5) of 8 Edw. 7, ch. 60 [Companies (Consolidation) Act, 1908], that the names of the undermentioned companies have been this day struck off the Register, and such companies are hereby dissolved:—

Air Stations (Dover), Ltd.
Davidson's Gyropter Flying Machine, Ltd.
Harrow Aerodrome, Ltd.
National Aviation Co., Ltd.

A COMING BOOK.

A book entitled "The Flying Machine from an Engineering Standpoint," written by Professor F. W. Lanchester, is shortly to be published. It has been compiled from the author's James Forrest Lecture, delivered before the Institution of Civil Engineers in May, 1914. Constable & Co.



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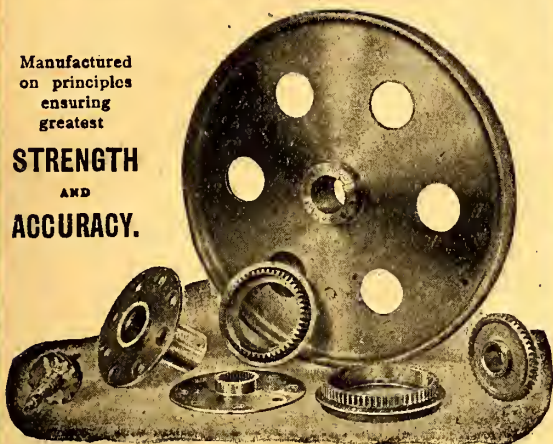
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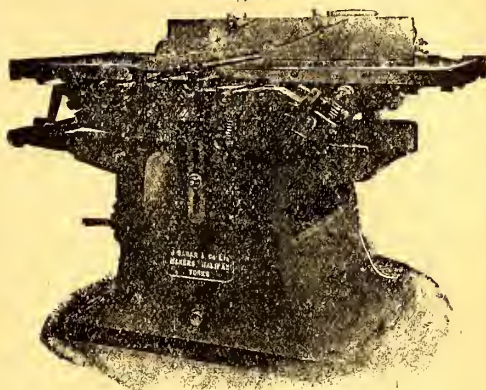
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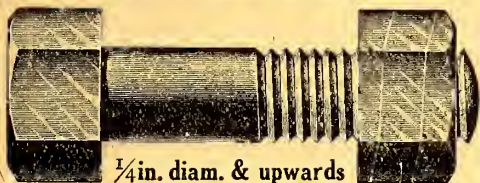
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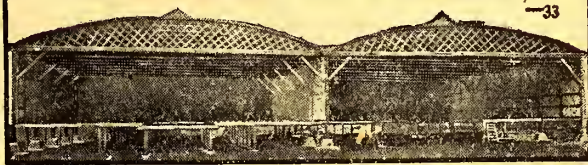
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THE CLAUDEL-HOBSON CARBURATION.

Most learned motorists will tell you that the carburettor is the heart of the motor. Others will affirm that it is the lungs, not unreasonably, after a stiff hill-climb. "But," say the mere anatomists, in their conceit of one of the few exact sciences that exist, "why wear your heart on your sleeve, or expose your lungs outside your body? It isn't even decent." And it is true that there has been a minority of such persons as Levavasseur, Brown of Leeds, and other quaint originals, who agree with the anatomists outright; while certain Italians, and even Herr Maybach, seem inclined to compromise.

Never mind; decent or not, scientific or not, the thing is done by the great majority. And in this world, the majority was ever the wealthier company. So why look to the desert? However, since it is better to be effective than scientific, it is best of all to be as effective as possible in the conventional way.

Which is as much the story of the Claudel carburettor as any other: the only difference being the degree of positive effectiveness.

And when it comes to use, and the endless combat with working conditions of all sorts, seldom twice alike, that degree is liable to assert itself. For instance, while on the road, or even aloft, you may indulge in all sorts of experiments, and still survive, aloft you dare not. Therefore, you must begin by rejecting every doubtful thing before you can choose, or even discover, what will probably suit you.

For what is your fundamental object? To have the petrol delivered in an amount always proportional to the volume of air that will give you automatically the right mixture for the load on the motor at any given moment.

That being so, except for starting, your air supply must be given free entry, so that its volume may respond to the demand of the motor positively without obstruction. You must have no air valve, because anything of the kind would have to be automatic; and being unable to reason, and only impelled by force against its will to get off its seat—how like any Cabinet Minister—invariably responds too late to do sufficient. And then, the occasion being past, it hunts for its own self-justification.

You must not have any springs, because they are springs, and really should not be seen on the motor at all, much less exist as the controlling item of its most vital part. You must not have any side holes leading to the mixture chamber, because they will upset the pressures therein. Nor may you have dashpot devices controlled by mercury, oil, or water, because all three fluids are variously affected by changes of altitude pressures, and do not, nor can possibly, recover so fast as an aeroplane can drop.

No kind of air-bellows control is any good either, as the tenuity of the air itself will change under heat, moisture, and so forth, a dozen times in as many minutes at the same altitude, let alone at constantly changing altitudes.

The whole carburation must be controlled by the throttle. Obviously, it cannot be by the jet, except passively. Clearly, then, the throttle, to be effective, must not be complicated, and should preferably be in one piece. And since it must depend on the jet, which cannot control its own output, it must needs control that jet, in some way or other.

So by elimination do we seem at last to get at the base, if not the whole law of carburettor design for aviation. Which being the most exacting of all motor use, one might say, for all the rest of it as well.

But obviously, there can be no simpler way for the throttle to control the jet positively, than to embrace it bodily.

And that is the essential mechanical feature of the Claudel.

For the drum-type throttle consists of a thick plug—exactly like a common tap-faucet, and bored through with the same sort of taper between the air and jet-chamber below, and the induction trunk above, but having one of its thick sides slotted transversely so as to embrace the top of the jet, and close the petrol apertures

in the wall of it, more or less as the throttle rotates, and also cut with two oval holes on either side of the transverse slot, to allow the mixture to pass, in volume according to the degree of throttle opening; this cutting being combined exactly in the shape of the Greek ω on its side.

There are two or three other mechanical possibilities to the same effect. But none is simpler. And as they are not the Claudel way, they call for no present discussion.

Still, the general character of one day differs from another and climates differ; so beyond these means for variable automatic, yet positive control, one needs others for general control. These are provided in the Claudel in the shape of a simple set-screw through the body of the carburettor, penetrating into the neck of the choke tube, at a right angle to the jet. Naturally, screwing it in towards the jet obstructs the passage of the air; and so makes the suction, and with it the mixture, permanently stronger, throughout the range of the throttle's action.

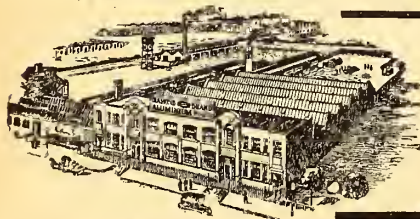
Again, no carburettor is complete without some means for keeping the motor just turning over with the throttle practically shut off. The Claudel way is to bore one hole diagonally upwards into the mixture trunk above the throttle, and from this another at a right angle downwards just to clear the edge of the hollow of the throttle, a second set-screw and needle-valve seating in where both leads intersect, to control the by-pass thus formed. For even when the throttle is fully shut, air can still enter through the slots by the jet; and the middle slot does not fully close off the jet. So a certain volume of mixture, just enough, is always available through the by-pass.

All these original features of the first Claudel model are retained in the new Model Z, single or double, for racing or aviation. Nevertheless, frequently in the former use, and always in the latter, we have the need for a sudden leap into full power. This, of course, means a sudden demand on the jet. Yet, pulling the throttle full open, for the moment we obviously lessen the existing pressures about the jet, and so defeat our object of getting a gush of extra petrol. Petrol inertia consequently delays adequate delivery, and, for the moment, we are bound to get a weaker mixture actually.

We must, therefore, have a constant well of extra petrol; and yet a well with a considerable static head: in other words, a gravity fall to ensure its instantaneous rise. Now, anyone who has ever poured out a tall bidon of liquid knows that the bumping flow occurs solely because the air can only reach the top of the liquid in gulps. Similarly, we all know that one receptacle cannot receive liquid rapidly and steadily from another, even with a funnel, unless it has a free passage of air outside the flow of liquid.

So it is essential that a jet petrol well shall have a free air supply to the top of it—that is, over the mouth of the well—so that nothing shall check the rise or fall of the liquid. But air set in motion has its weight, and consequent pressure-force, just as much as any denser fluid. If, then, a confined and directed volume of air be so greatly in excess of a given volume of denser fluid, that it weighs as much, or nearly as much, it will exert a considerable pressure upon the latter to move it, over and above the existing gravity. In short, force-feed is automatically exerted upon the liquid.

Mechanically, then, it follows that the air supply-chamber to be of so much greater volume than the petrol well, must be externally concentric to it. It also follows that to allow the petrol to escape, there must be a number of free outlets into some other passage. These cannot be outward through the well-wall into the air-chamber: so the passage must be concentric again to the well, in the form of a freely perforated tube. Yet that tube must be capable of holding as much as the well did; so that the fluid set in motion shall not overflow, when the demand-force ceases. Added to which, there must be, somewhere, a second small output



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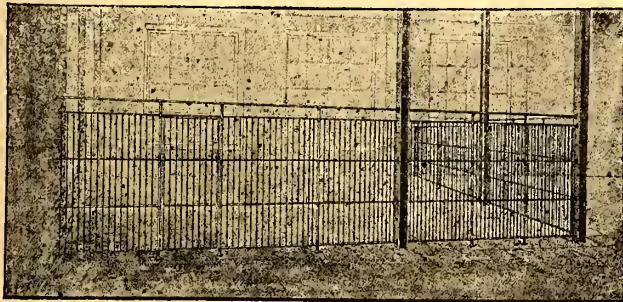
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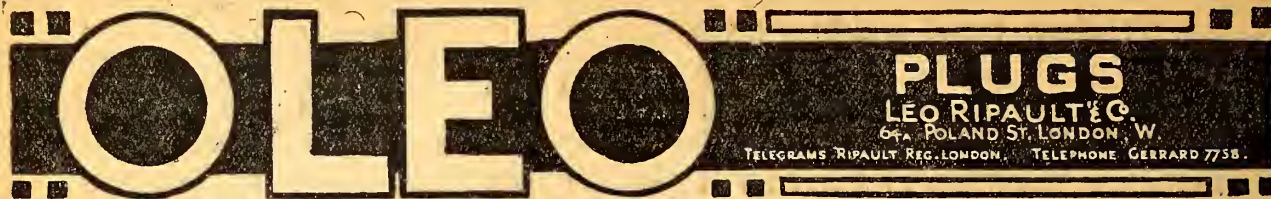
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of petrol, fed from the same supply as the well, and subject to the same pressures. Nowhere can this be so conveniently placed as concentrically to this main exit tube: chiefly because, so placed, the change from the small demand to the large, or *vice versa*, however sudden, will be imperceptible.

Now the foregoing are precisely the physical conditions which exist in the Claudel compound diffuser jet, and have consequently contrived its special mechanical design.

At the bottom, as a foundation, is the vent and supply-plug, which is formed in a hollow cup, and drilled into the cup, so as to make a connection for the petrol supply from the float-chamber outside the cup to its interior.

This plug has its cup portion threaded into the bottom of a second plug, wide and sleeve-like, which is screwed into the base of the jet-chamber, and carries the jet.

Now pressed upon a shoulder on the top of this second plug, is a thin outer tube, with a large annular chamber at the bottom, freely drawing air from a duct in the casting. This is the air tube, outside everything. Next inside it, pressed into the top of the plug-sleeve, is the guard tube or petrol well, which runs nearly to the top of the air-tube. Then, next inside the guard-tube, is the diffuser or main-jet tube, screwed into the hollow of the plug-sleeve, on the top of the vent-plug cup.

Being freely perforated, and open at the bottom to this cup, this diffuser tube fills the well or guard tube outwardly through its perforations. And having its top widely flanged out, this flange forms a cover for both the guard tube and air tube; in the latter case, air tight.

Centrally of all, the pilot jet tube is screwed into the bottom of the vent-plug cup, with a perforation at the bottom to admit petrol, an internal constriction-shoulder to restrict its flow, perforations above this to admit air from the top of the diffuser tube and a final set of perforations beneath its plugged top. It also carries wide flanges to form the cap or spraying portion of the diffuser-jet.

Now, with this central pilot-jet tube, the annular space inside the diffuser tube looks wider, but is actually of the same capacity as the annular space in the guard-tube or well outside it: so the gravity balance of the petrol is the same in both. But this second annular space is progressively very much less than the outermost one in the air-tube: so the air volume is very much greater than the petrol volume; so much so that their respective volume weights are in proportionate balance.

From this construction it will be evident that so long as the throttle is closed, the suction through the by-pass above will be concentrated on the pilot jet only: and the balance of fluid pressures in the main jet remains undisturbed; but that as the throttle opens, the suction becomes gradually transferred to the main jet, and the moment the petrol falls in the guard-tube, or well, the air rushes up the outer tube over the top of the well, and by its weight and velocity forces the petrol out through its escape or emulsion holes in a cloudlike spray of rich mixture which emerges through the main jet opening to be impoverished to exactly the right strength by the main air supply in the choke tube.

We may also observe that, set as the pilot jet tube is into the vent-plug, the rotation of the plug ever so slightly raises or lowers the tube, and with it the flange body that forms the cap of the main-jet: so that by these simple means the entire device may be set for petrols of different specific gravities.

Such then is the entire working system and *mecanique* of the Claudel. And being so simple, its construction—all the more

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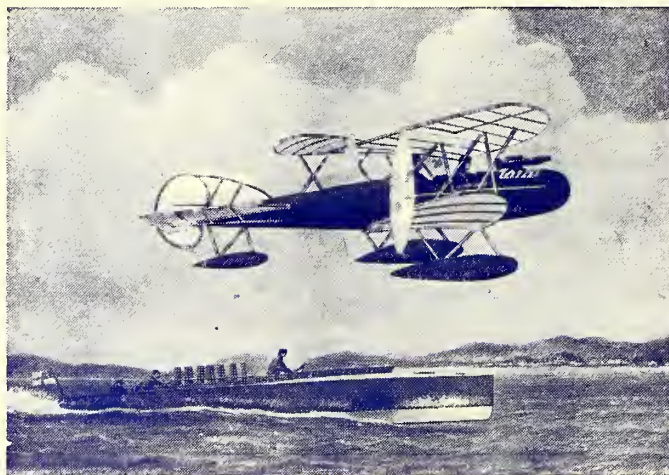
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ON THE FLYING OF PEACE KITE-BALLOONS.

If the war-kites of the ever-to-be-lamented S. F. Cody were still considered part of our Naval and Military equipment, it would be this paper's duty to discuss them, and, anyhow, kite-balloons are distinctly within its province. Therefore one may assume that peace-kites of the genus *Tentonicus* are also within its sphere of influence, so to speak.

Last week's peace-kite was a distinctly elaborate and even praiseworthy effort, reflecting considerable credit on the skill and ingenuity of its contrivers. To say that the bubble was soon pricked is not such a fine example of the *taurus Hibernicus* as might appear at first sight, thanks to the existence of the afore-mentioned kite-balloon, which combines elegantly the functions of the kite and the bubble, and it is not without interest to note that the kite-balloon and the peace-kite are both German inventions which are at once of high utility and a precarious perch for their users. Let us therefore discuss the German peace-kite-balloon-d'essai.

Imprimis Germany's offer of peace, assuming it to be genuine, as it is only fair to do, is skilfully calculated to put the Allies for ever in the wrong morally, no matter what may happen hereafter. If in a common or street row one knocks a man down, and then with seeming magnanimity asks him whether he has had enough, it is his own fault if he gets a still worse hammering when he starts fighting again. And if, on the other hand, he recovers and knocks one out in turn, one is always in a position to remind him that one did not want to go on fighting, and that the least he can do is to behave decently in his turn.

Unfortunately, those who adopt the foolish course of asking a man whether he has had enough before he is absolutely pounded to a jelly are apt to forget that the knock-down blow plus the insult of the assumption that he is already beaten are together quite likely to stir up all the latent energy in that man, with the natural result that, when he is on his feet again and he gets his second wind, he is a far more dangerous opponent than ever he was before. He will probably forget the rules of the game, and will simply wade in for a fight to a finish—all blood, hair, and teeth.

AN AWARD ON POINTS.

A good sound scientific soldier, discussing the war the other day, said quite casually that of course Germany had won the war. The remark naturally produced a howl of protest, till he explained that, if one roped in any trustworthy neutral soldier as umpire and asked him to decide the result on points, taking to-day's position as the basis of award, he would have to rule that Germany had won every round so far. Even the success of the Somme Push, with its carefully selected "limited objectives," of which our recently instructed military critics have written so learnedly of late, though a distinct point for us, is offset by the capture of the Rou-

manian grain and oil areas—a disgraceful episode of which one cannot write freely until after the war.

Thereafter he went on to explain the difference between a fight of so many rounds, in which the verdict is given on points, and a fight to a finish. One has seen a boxer who was obviously superior in ring-craft knocked out by the pure weight and pluck of a man who is scientifically his inferior. One recalls, also, the historic Heenan and Sayers fight, which Sayers won on pure staying power, after fighting many rounds with a broken arm. Probably no one but an Englishman would have been so foolish as to go on fighting with a broken arm, and possibly no nation but England would be so foolish as to go on fighting after such humiliations as the Gallipoli affair, the surrender of Kut-el-Amara, the Mesopotamia scandal, and the Balkan muddle.

THE NOT VERY SICK MAN.

The humiliation of these affairs is the greater in that it has been inflicted on us by a nation we have long despised in a half-pitying way. Our erstwhile friend, the Turk, whom we called "the sick man of Europe," has proved to be not so very sick after all. Everyone of my acquaintance who has fought him loves him like a brother. He has behaved like a gentleman and a sportsman on every battlefield. As a highly esteemed Irish friend of mine put it, "The Turk is a dam good chap; but if you show him an Armenian, he is apt to lose his head."

As to Turkish atrocities, this war has shown that there is little enough to choose between East and West in such matters. There may be good Armenians, but all the Armenians I have ever seen personally seemed pre-ordained to be atrocitised, and I fancy few of our people who have fought in the Balkans think any the worse of the Turk for the atrocities alleged to have been committed on the Bulgarian and Greek, with which Liberal politicians once wrung the sentimental heart of the English Nation.

Incidentally, I wonder how the gentleman feels who during the first Balkan War wrote that elegant poem to King Ferdinand of Bulgaria—was it in the "Mail" or where?—with its refrain, "The New Crusade rides into Byzantium." The last word rhymed with "drum," I think, which rather gave a touch of bathos, though the intention was excellent. But how fortunate that the Bulgar Crusaders never reached Constantinople!

One could write a whole book about the quaintly chivalrous behaviour of the Turk in this war, which may perhaps alleviate our humiliation. There is, for instance, the story of how, when Major Reilly, R.F.C., and Captain White, of the Australian Flying Corps, were captured, Nur-ed-Din, the Turkish G.O.C., stopped the battle for half a day while he sent in a fatigue party under a flag of truce to the British G.O.C. for their kit, and of how, on receiving a note hoping that they would

be well treated, he sent a reply to say that they were dining with him that evening, and that no anxiety need be felt about them.

There is also the wonderful story of certain Naval officers, captured in the Dardanelles and the Marmora, who were imprisoned in a noisome dungeon for twelve days, by way of reprisal for rumoured ill-treatment of Turkish prisoners in Egypt. To them on the twelfth day came a Turkish staff officer, full of apologies for the mistake, saying that it had now been ascertained that the Turks in Egypt were being excellently treated, and asking them to accept as a slight act of reparation the hospitality of the Turkish Government at Constantinople's best hotel, a new outfit of kit at the Government's expense, and any money they might require for twelve days' leave in Constantinople, to go and see and do what they pleased, subject only, with further apologies for possible inconvenience, to having a Turkish officer with them, just in case any of the lower classes might behave rudely.

It would be almost an insult to the Turk, after some of the acts of most religious and civilised Europeans, to say that he has behaved like a Christian and a gentleman. One can, however, say that he has worthily upheld the chivalry of the Byzantine Empire. One can only hope that the day may come when the Turk will see the error of his ways and become again our very good friend as he has been in the past. He has already proved himself to be still worthy of one of the world's greatest fighting races.

And when one considers that before the war his political leaders might have been bought for half a million or so, one thinks still less of our own political leaders and their international deals.

A MATTER OF CAUSE AND EFFECT.

However, to return to the German peace-kite-balloon. Undoubtedly one of the many clever motives which inflated it was the knowledge that, if the Allies refused to discuss terms of peace, the German people would be the more firmly convinced that they were the victims of a conspiracy among the Allies for the destruction of the Germanic Empires, and so would be inspired to fight on in the desperation of self-defence.

This doctrine of conspiracy against Germany has, obviously, been the motive power behind the marvellous and patriotic efforts of the German people, who have not reckoned with the possibility that the war may have been brought on by their own Governing Classes primarily with the object of swamping the growing power of Socialism in Germany under a wave of warlike Patriotism. A scheme which would again put all power into the hands of the Military and Junker castes.

There was also the secondary motive that, owing to the reckless methods of German trading all over the world, Germany's banks, which financed her trade instead of being merely money-boxes as is the English custom, were on the verge of bankruptcy before the war, and the prospects of a swift victory over France and Russia, with a big indemnity to follow, seemed an easy way of restoring her financial stability. Germany's political leaders were apparently assured by some English misleaders, that England would take no part in the war, and, if so, this portion of the programme must have appeared plain sailing.

I must apologise to the older readers of this paper for repeating this outline of the causes of war, which I set forth a few weeks after war broke out, but so many thousands of new readers have adopted the paper in the past two years that it seems worth while to raise these points again, and, anyhow, probably most people have forgotten them after twenty-seven months or so. Moreover, there is some possibility that documentary evidence of those pre-war assurances of England's neutrality may

be playing its part in that seeming tenderness to enemy interests which has given rise to the legend of "the Hidden Hand."

So general is the belief that some influential Englishmen are, for some mysterious reason, under the power of Germany that the complicity and duplicity of individuals are freely discussed in conversation, if not in print. As, for instance, by my Irish friend, famous for his mastery of phrase, who remarked, "Yes, the Germans have got old So-and-So in the hollow of their hand. And" making a motion as of operating a motor-horn "every time they squeeze him he emits queer pro-Boche noises."

Very prettily put, and, though one hopes there is no foundation for these scandalous tales, one is the more pleased to find the Government of this country mainly in the hands of men of action, who evidently mean to win the war, regardless of consequences, even to their best friends.

The soundness of the British people at heart, perhaps for lack of head, was never better shown than when Germany's peace proposals arrived. Nobody turned a hair. The fall of Asquith, as one noticed a week before, caused a kind of national sigh of relief, but the peace proposals had no effect whatever. Conversationally, they formed a sort of side-issue of the war, which one discussed academically or by way of comic relief, but no one took them seriously, as likely to have any real effect. People talked over the influence the proposals would have in Germany, but no one assumed that they would have any influence in this country, except that they were regarded as rather encouraging—a kind of pleasing savoury, coming after the Reduced Cabinet menu set before the Empire by Mr. Lloyd George.

The "Globe," in an inspired moment, issued a poster bearing the one word "Kamerad!" in huge letters. A clever touch which summed up neatly the general sentiment of the British people towards the peace-kite-balloon. Somehow, when one comes to think of it, the kite-balloon's typical attitude—once described as that of a suppliant sausage—is somewhat expressed by Captain Kendal, in his famous ode to the back view of a kneeling elephant—"Like a very fat man praying"—so the kite-balloon simile is perhaps more apposite than one thought.

Not that the Germans are officially begging for peace by a long way yet, for, though there may be some grounds for the stories of "Berlin in a Frenzy" over the peace proposals, as we have read in some papers, *via* Amsterdam, the German people may be praying to their "Good old God" for peace without feeling in the least inclined to pray to the Allies for mercy. The real point is the psychological fact that the Germans should feel inclined to pray for peace just at the moment when the slow-witted Englishman is awaking to the fact that there is actually a war going on, which is affecting him personally through his most vulnerable part, his stomach.

This fact, coinciding as it does with the intense activity of the German Submarine Service and the long-desired change in the Government of England, marks an epoch in the progress of the war. Henceforth there is every hope of the war being officially conducted with energy, thanks to the new Government, with deadly earnestness on the part of the people, owing to the obvious shortage of food luxuries, though not as yet of necessities, and with cheerfulness because of Germany's expressed desire for peace. Clever as have been all the German moves at this juncture, they have had precisely the effects least desired, owing to misjudgment of that weird curiosity, the psychology of the Englishman.

CONCERNING REVOLUTIONS.

As regards the effects of the proposals in Germany, they also may be other than were expected by their

authors. There is a comic rumour going about the country at present, as wild, presumably, as the rumours which infested the nation early in the war, to the effect that a noted supporter of the "Be kind to Germany" policy in this country, or in other versions, a victim of the Hidden Hand, was in Switzerland recently, and there negotiated with German emissaries the terms of peace lately made public—allowing, one assumes, a certain margin for bargaining at the Peace Conference over such matters as the fate of Serbia and the German Colonies. For example, England might be bribed to support the surrender to Austria of Northern Serbia, which includes the Berlin-Vienna-Sofia-Constantinople-Baghdad Railway and the establishment of the Polish-Lithuanian Kingdom, at the expense of Russia, as a buffer State for Germany, in return for German East Africa, and the freedom of the line for the Cape-to-Cairo Railway, which is at present blocked by "German East," as the South Africans call it.

The story has it that this nice little arrangement, with Peace attached thereto, was just about to be sprung on the British Empire, regardless of her Allies, as *un fait accompli*, when certain people over here discovered all about it. Hence the recent political revolution. And rumour says that the international negotiator has not been seen since.

One cannot help thinking that, if any such trick had been played on the people of England just when they were seriously taking off their coats and rolling up their shirt-sleeves for a real trial of strength, the energy thus made ready for action might have expended itself in a revolution after the best French model, complete with lamp-posts and political corpses as fitted.

If one assumes that the German offer of peace was sincere, one may perhaps believe that there was, if not a genuine scheme such as this rumour supposed, at any rate some sort of understanding somewhere before the

offer was made. And if the German people, believing that there was, a week or two ago a chance of peace, find that they have been, in the vulgar phrase, "sold a pup," they may be induced by one section or other of their own leaders to take any course most suitable to the particular section which takes hold suddenly.

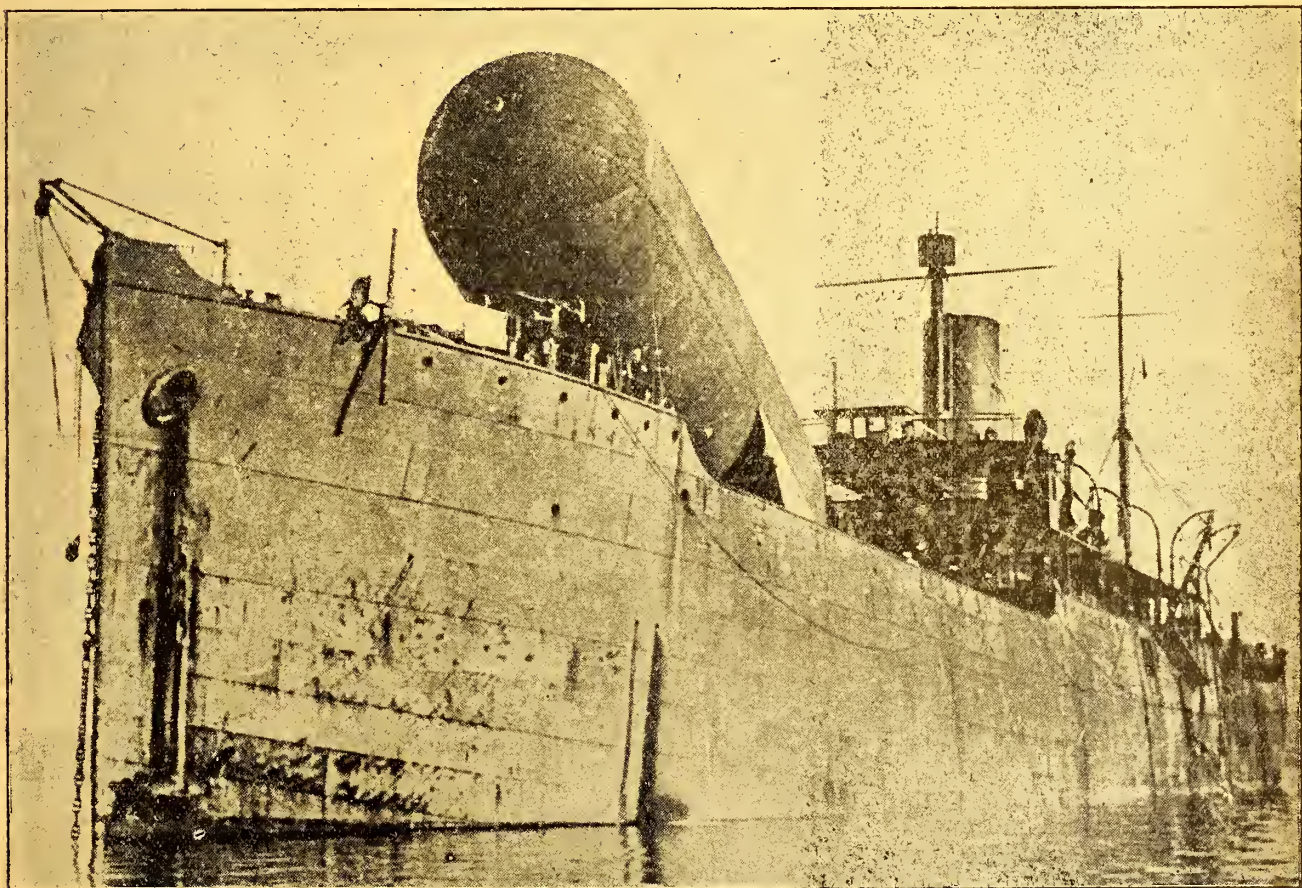
There is a pleasing story of an American of some position who returned to the States not long ago. Before he left Berlin he had an interview with a highly placed German official, who asked him confidently, "Do you see any prospects of a revolution in Germany?" The American looked him very straight in the face and replied, "Not unless you order it."

The German looked startled for a moment, as if wondering whether the American had unearthed some horrid State secret, then he grunted the usual "Ach! So!" and changed the conversation.

There you have a very distinct possibility. The Germans, as a whole, bar the Prussians, are a peaceful and docile people. They certainly want peace, because Germany is now bearing the military, financial and industrial burden for all her Allies. Austria and Hungary have had enough, and they do not in the least dislike England, Bulgaria is not really interested in anything except strafing Serbia, Greece, and Roumania, for their acts in the second Balkan war. Turkey would just as soon fight on our side as Germany's, or probably would prefer to do so but for Enver Pasha and Co.—and, possibly they might still be bought if we knew how to go about it. Germany is the brain and the muscle of the whole Confederation.

Now, if at any time the German politico-military leaders feel that they are so badly beaten that they must give in anyhow, they will be up against the problem of how to do it with safety to themselves.

If they calmly surrender, there is every probability of the people turning on them and revenging on them the



A British Kite-Balloon, rising from its Mother Ship in the Mediterranean.

deaths of their young men and the privations they have suffered themselves, for be it remembered, thanks to cheap education and national discipline, a German mob is more active of brain, and more united in action than the mob of any other nation. And the German Socialists have far greater leaders than the Socialists of any other country.

What then could be simpler than for the military politicians, many of whom have no reason to love either the Kaiser or his unduly exalted progeny, to turn to the mob and say?—"Here are the causes of your agonies! The Emperor and the Crown Prince caused this war. Let them pay you for it."

The All-Highest has continually posed as the leader of the German armies; there would be no difficulty in fixing on him the blame for the armies' defeat. That is the worst of being an unconstitutional monarch: one becomes personally responsible for failures as well as successes. A dynastic revolution would be a very simple method of obtaining for the German military caste "peace with honour" so far as the German people were concerned.

Or again, the military caste might easily turn the mob against the German-Jew financiers, as the cause of all their troubles, and as blood-sucking profiteers. Or on the other hand, the financial politicians, finding that nothing but ruin stared them in the face if the war were allowed to continue, might turn the people—which includes the Army—against the military and Junker caste. So that one sees quite distinct possibilities for a skilfully contrived revolution "made to order."

If the people themselves raised a revolution it would afford them a fine opportunity for repudiating the huge National Debt raised by the war, and for thus relieving themselves of the colossal burden of taxation which they must bear for ever after, as will the subjects of the Russo-Franco-British Alliance, but it is rather too much to expect the docile German of the lower and middle classes to do anything so desperate as to revolute, except under orders.

As my friend Mr. Bayons pointed out in his lucid and illuminating article last week, there is no earthly chance of any nation paying or receiving an indemnity after this war. All that can happen is that a verdict will be given against one party, but no order will be made as regards costs, each party paying its own,—except that some people on each side will have to pay in addition interest on what they have borrowed from their richer friends. And the richer friend will find his own costs reduced by that amount, till he quarrels with one or other of his friends and cannot obtain payment of the interest any longer.

A MORE CHEERFUL OUTLOOK.

Taking it all round, every intelligent person in this country has every reason to be pleased with the recent

turn of events. The people are really feeling the pinch of war at last, and a good hard pinch is an excellent way of waking a man up, and of making him angry with the pincher at the same time. The end of the war is probably a very long way off, but the issue is by no means so uncertain as it was when every fool Englishman believed we were going to win, whether he helped or not, just because it was our birthright. Perhaps now he may begin to see that it is necessary for him himself to help to the best of his ability, if only by doing his job, whatever it may be, as well as he knows how, instead of wasting half his time eating and playing according to the time-honoured English custom.

There has never been a more critical period in the history of the British nation than this December of 1916, and there has never been a more hopeful period for us in the history of the war. We shall probably have worse times before we win through, but there is always the consolation of the old military adage, "The British Army always loses every battle except the last."

Losing a battle does not mean being defeated so much as it means failing to win it. So far, we cannot claim to have won absolutely any action which has had a decisive effect on any round of the war, barring that the little Expeditionary Force helped gallantly at the Battle of the Marne. But there is no limit to the number of rounds, and there is still the knock-out to come. Which is where the British Army will score.

The German kite-balloon has gone up, and has descended punctured. One imagines that its observers did not spot much which could afford them any satisfaction. The Allies seem more firmly emplaced than ever. England, at any rate, is only just beginning to settle down to work. By this time next year we should be really in full swing, unless the absolutely unexpected happens, and we may all be then happier than we are to-day.

Meantime, there is no reason why we should be unhappy to-day. Therefore, let me wish all my readers a Happy Christmas, happy because the Nation is at last "finding itself"—in the shipmaster's sense.

Many of us have lost those dear to us, and we shall always feel their loss deeply. I refuse to write the usual sickly cant about being happy that they have died for their country: one would rather that they had lived for themselves. But, anyhow, they have gone, and they are probably far happier where they are, looking down our silly little tribal squabbles, and seeing the humour of our frantic struggles when illuminated by the light of eternity. Perhaps they will tell us the point of the joke themselves some day.

Anyhow, we need not be sorry for them, but only for ourselves, and the best way to stop being sorry for ourselves is to dig out and work, and so arrive at making others, and, consequently, ourselves happy.

Therefore, a Happy Christmas to you all.—C. G. G.

THE SPORTING VIEW.

The following letter has been received from a Naval officer who has served in the Mediterranean, and indicates the feeling the people who are really trying to win the war have for the enemy. It also assists to explain why Germany has succeeded in standing up against overwhelming odds for so long, as undoubtedly the spirit which inspires some of the best German aviators must exist in other sections of the German Army to a considerable extent:—

"On page 1166 of your issue of December 6th, in the last paragraph of the news received from Denmark, it is stated that the German Fokker pilot, Capt. Buddecke, has met his death. As I have seen no previous report to this effect, I wonder if you can give me any particulars as to how and where it took place?"

"All the members of the Wing of the R.N.A.S. serving in the Eastern Mediterranean (to which I was attached as observer till last —) are very interested in him. He first brought the

Fokker to the Dardanelles in December, 1915, and, after returning to Germany, came out again in March, 1916. He was known to all as a thoroughly sporting opponent, and a marvelously good pilot. The way in which he handled his machine in a scrap was really astonishing.

"At the end of March he was driven down (while engaging two of our scouts) and apparently 'crashed.' Later, however, he was reported as having returned to Germany and having been decorated by the Kaiser. Last July we again heard of him as having charge of a Fokker Squadron at Smyrna (from which we thought that possibly his flying days were over), when we were operating from —.

"I left in —, being recalled to —, and so have had no further news of him. I hope that, if he has been downed, it was by one of our fellows out there, as he certainly took his toll of them when they were supplied with nothing to fly but 'Fokker Fodder.'"

[No details of Capt. Buddecke's fate have been received, but his death was officially notified in the German papers.—Ed.]

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On the Standardisation of Aircraft Parts.

A METHOD OF INCREASING AND SIMPLIFYING THE PRODUCTION OF AIRCRAFT FOR WAR PURPOSES.

By BERNARD ISAAC.

The problem of standardisation has always been one which has at first been avoided by every branch of engineering, and eventually when it has been "tackled" and solved progress and prosperity have always followed.

We are told that in the early days of the bicycle manufacturers went out of their way to design every part, even to a tiny screw or bolt, so that it would be entirely dissimilar from any other type of part serving the same purpose on other types of machines then in use. The idea was that so long as the part was not interchangeable with a similar part made by another manufacturer, or so long as it could not easily be substituted by a standard screw or bolt obtainable at an ironmonger's shop, the user would be compelled to purchase every spare part required from the original maker of the machine, which would materially increase their turnover and profits, as the prices demanded for these parts were often many times more than the cost of a standard nut or bolt, easily obtainable in the ordinary way.

Another obvious reason was that the designer feared lest he should be accused of "copying" the design of another manufacturer, and was anxious that every separate part on the machine should be identified as belonging to the machine of his own particular make or design. The result was that users looked upon a cycle journey as a kind of "great adventure," with the dark possibility of a breakdown *en route* through the loss of a simple nut or screw, which it was impossible to obtain except direct from the maker at a high price, and after long delay. The progress of the bicycle industry was, therefore, slow and indefinite.

This policy was also adopted by the earlier manufacturers of motor cars, sewing machines and other appliances, which are to-day actual necessities in the life of the people—due, primarily, to the adoption of a recognised standard which reduced the cost, increased the output, encouraged the user and, consequently, improved the design and utility.

Now the aircraft industry has reached the same stage in its progress, and, in spite of the lessons we should have learned, the same mistakes are being made; designers are still designing parts for which there exists, or should exist, an accepted standard. Output is slow, cost is high, and many thousands of man-hours of skilled labour are being wasted on the production of small numbers of many different types of parts which are similar to each other, and yet entirely different.

The real boom in the bicycle industry came only when that progressive and well-known firm of manufacturers, the Birmingham Small Arms Co., commenced to standardise parts for the use of bicycle manufacturers, which became known throughout the trade as the "B.S.A. Standard," and which covered almost every part of the machine. After a proper scheme had been organised, pedals became interchangeable with other makes of pedals, and bolts, nuts, screws, etc., were interchangeable with those on most of the other principal makes of machines, and the standardisation scheme was also applied to hubs, rims, tyres, chains, sprockets, cranks, saddles, handle-bars, etc. With the common adoption of this standard the bicycle came into its own—its progress was rapid and its success immediate.

THE AIRCRAFT ANALOGY.

Now as to aircraft parts. There does not appear to be any undivided opinion; all constructors admit the desirability of their standardisation, but as yet—except so far as the series of "A.G.S." parts standardised by the Royal Aircraft Factory, and certain parts standardised by the Admiralty are concerned—no move seems to have been made in this direction. Manufacturers appear to look upon the task as almost impossible and, in any case, undesirable in war time, and the tendency to shelve this matter for consideration some time after the war grows stronger. As a matter of fact, the necessity for the immediate adoption of a co-operative scheme of standardisation actually grows stronger as the war proceeds, and the existing lack of standardisation is a menace to the continued progress of design and production of aircraft in this country, and their work in the war which, up to the present, has been remarkable, reflecting credit as it does on pilot, designer and constructor alike. The only standardisation that has yet been adopted generally among constructors is as regards the method of control, and this alone must have facilitated design considerably.

This short article will endeavour to show, so far as space permits, how our present position with regard to standardisation affects output and design; to suggest the remedy in the form of a real scheme of standardisation; the method which should be adopted to attain this object; and the results it would achieve.

An excellent example of the advantages of standardisation may be drawn from the series of A.G.S. (Aeroplane General Sundries) Standard Parts for Aircraft, designed and standardised for use on machines of R.A.F. design by the Royal Aircraft Factory, who with the A.I.D. should receive credit for having formed the foundation of a scheme of standardisation, which, it is to be hoped, will spread itself throughout the entire industry.

When the R.A.F. commenced to supply blue-prints for the construction of machines of its own design, such parts as could then be standardised for use on all types of R.A.F. aircraft were grouped on what are known as "A.G.S. Sheets," covering bolts, nuts, washers, turnbuckles, seats, tank fittings, streamline wires, tie-rods, screws, etc.

For screw threads and sizes of bolt heads and nuts they adopted the standard laid down by the Engineering Standard Committee's Report, which is a standard for all threads where fairly fine adjustment is required, and it is also a thread which is easily obtainable in this country. The knurling, grooves, and slots, which were intended as identification marks, have now been cancelled, as these added to the cost and delayed production.

There are also a great many parts of R.A.F. design, such as hinges, strut ferrules, skid fittings, etc., which, although not officially included in the A.G.S. standard, are used on most R.A.F. machines, and which will no doubt eventually be officially adopted as standard. These are in all cases suitable for use on aircraft of private design, and no doubt there would be no difficulty in obtaining permission to embody these in manufacturers' own designs.

There may be cases where an existing A.G.S. part, while being more than suitable for the job it is intended for, has been designed without consideration for the importance of speed in manufacture, economy in production, and simplicity in design.

It is not suggested that the A.G.S. Standard should be adopted by the industry without certain modifications, which may perhaps be necessary, and, further, the field for standardisation is so wide that the A.G.S. Standard can only form the groundwork for a much greater and more comprehensive plan. In the case of complicated A.G.S. parts, simplification should be introduced so as to bring these within a commercial standard, always, of course, bearing in mind that their utility and effectiveness should not be lessened.

COMPLICATION OF SPECIAL PARTS.

Special parts should be avoided whenever possible, and, if a special part becomes necessary, designers should give consideration to the desirability of recommending it for inclusion in the general standard for the particular job it is intended to carry out, and with it, it desirable, supersede any existing standard part. The existing standard part could perhaps, if possible, be redesigned to suit the new requirements, or a new part might be evolved to include the best points of the two designs.

A.G.S. and certain Admiralty standard parts should form the basis of any standardisation scheme, as these are of known strength and usefulness, and a definite standard can be fixed without difficulty for many parts not provided for in the A.G.S. series.

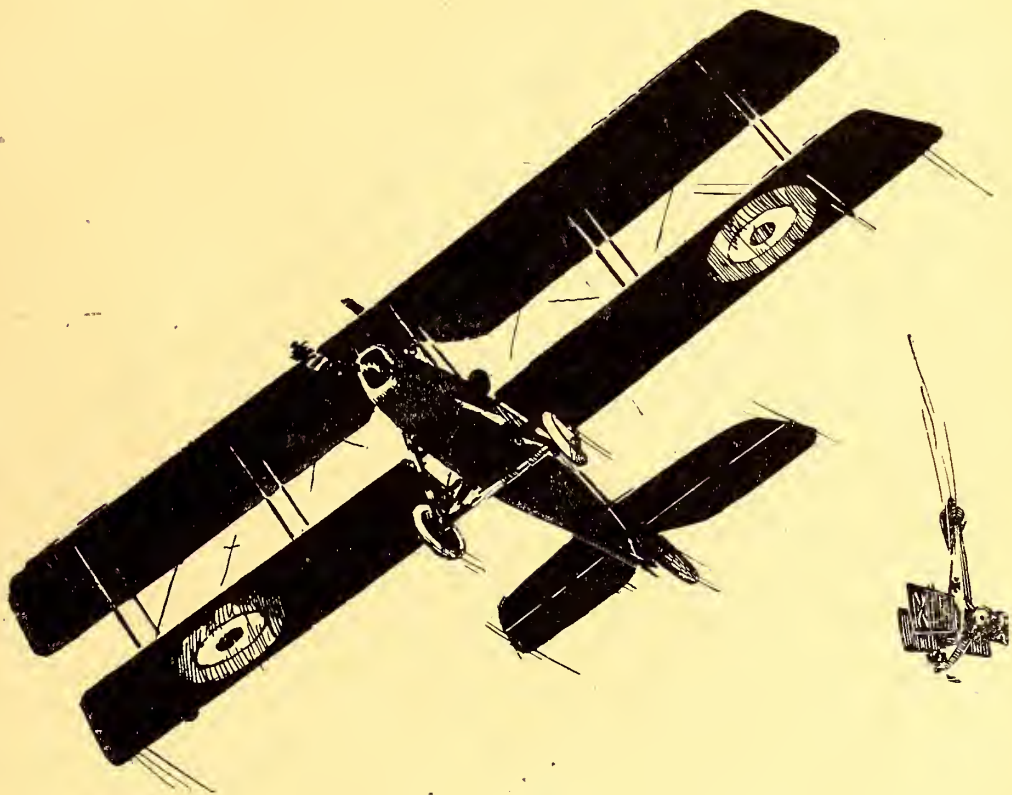
It is known that there exist in the British Flying Services to-day several types of aircraft on which no less than four, or even five, different screw thread systems are employed—besides innumerable different systems of bolts and nuts, including specially designed sizes, which are all easily replaced by a bolt or nut of a common standard, and which could do the job equally as well. The result is, that apart from the greatly increased number of various sized small parts it is necessary to stock in the Service stores, manufacturers experience difficulty in obtaining supplies of the metric, Whitworth and other types of screw-threads, which are being used in addition to the A.G.S. or B.A. and B.S.F. types, which are now to be had in large quantities with difficulty from existing stocks, in many cases.

There must be a deal of skilled labour wasted on the production of these parts, as well as delay in delivery; whereas if a standardised type of part were universally adopted to do the job of all these various parts, this could be concentrated upon and made on automatic machinery—hand-labour being eliminated as far as possible. This work, which could be carried out by women labour, would release a great deal of "man power" now employed on special fittings, which would be replaced by standardised repetition work, and as very large stocks of the standard parts could be kept without having to gauge the trend of design, an increased output of aircraft must naturally follow.

To enable manufacturers of aircraft of private design to transfer from their existing parts to the standard proposed, a comprehensive chart should be prepared to show those parts and fittings (metric, Whitworth, etc.) which are common to most of the machines at present in use in the Air Services, and indicate the most suitable A.G.S. or other equivalents. Where a suitable A.G.S. equivalent does not exist, a new standard should be created which will provide an interchangeable part or fitting to be standardised in place of the multitudinous but similar types of parts now in use of varying threads and designs. This would enable manufacturers who have already decided to adopt the A.G.S. standard as far as possible, to substitute the parts they are using at present more easily.

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SAVING OF TIME AND MATERIAL.

Another point is that it would be impossible ruthlessly to scrap out-of-date machines during course of construction, and still have an enormous number of parts available for the new design. This matter, of course, depends very largely upon how comprehensive the scheme of standardisation can be made. It is obvious that by the elimination of the present innumerable types of the one kind of fitting and the adoption, in substitution, of a standard part, that the result would benefit aircraft-production to-day.

The remedy lies with constructors themselves, who should form a strong committee of members of the S.B.A.C., on which Admiralty House and the Admiralty should be represented, and with co-operation as their watchword, there is no reason why a convenient standard for bolts, nuts, washers, and the less important parts should not be immediately adopted and carried into practical effect. It is not suggested that it is a simple matter to provide a standard B.S.F. size bolt to fit a metric hole, but it is certainly easy to provide a B.S.F. size hole instead of the metric hole, to fit the B.S.F. bolt. Simplify the labour of designing by working to a standard, not away from it. Neither the merit of the design, nor the factor of safety, need be affected in any way. The experience gained from the general use of standard bolts, etc., will encourage the manufacturers to evolve and adopt other parts suitable for standardisation, and so long as a type does not lose its individuality by over-standardisation, there is no saying how far the principle may be extended.

There are known to be cases where two types of machines, designed and constructed by the same works, differ in the types of some of the parts employed to do the same "job."

Opinions may differ as to what parts are the most suitable for standardisation, and as to how and of what material these parts should be made. The essential points, however, will probably be as follows, and while considering these it must be remembered that millions of parts of, say, 100 different types are being made to-day in, say, 500 different shops, whereas their job on the machine could be carried out by one standard part made by a few firms who are specialists in this particular work, and who could supply the whole of the industry practically from stock at about half the price.

ESSENTIALS.

The essential features of a standard aircraft part, either metal or wood, should be as follows:—

(a) It should be able to take the strain and do the job of other parts of varying designs that are common to machines of several designs now in use. Although the factor of safety might be reduced to a minimum, it should not come below that which is called for; the same design should be maintained, if possible, to take various strains, if necessary, and graded series of the same design, either in size or material, should be provided.

(b) It must be interchangeable with other similar parts.

(c) The specifications for material, while ensuring the necessary tensile and other tests, should be, as far as possible, of the ordinary commercial standards easily obtainable in large quantities and of reasonable market value.

(d) Simplicity of design and available resources in the way of material, labour, and machine tools should be studied with the special object of ensuring speed in production combined with the least amount of skilled labour.

(e) It should preferably be a part constantly in use and the demand for which is great, thus enabling suppliers to maintain large stocks, at a low cost, for immediate delivery, without being necessarily speculative.

(f) "Fits" and "limits" should be of reasonable commercial standard, although accuracy should be demanded as far as possible and where necessary.

(g) The basis for calculations should be a simple one.

METHODS OF PRODUCTION.

Automatic repetition work, which would ensure accuracy and require less time to be spent on examination, should be encouraged.

Simpler methods of production should be introduced, using mild steel instead of high tensile steel when possible, and there is also the possibility of making forks and eyes of strainers, etc., from stampings instead of from the solid as at present.

It is recognised that if manufacturers of small parts could undertake the supply of these to metric sizes in large quantities the International Metric Standard for screw-threads and measurements would be the ideal basis for a new standardisation scheme in view of the fact that calculations are simple and quick. The machine tools in this country being mainly adapted and occupied in turning out fittings for all branches of engineering to the recognised B.A. and B.S.F. standards, it would be hopeless to attempt to standardise a part that could not be handled by any ordinary engineering works. Until the metric system is adopted generally by all branches of engineering, as it may come to pass some day, we must be content to use the standard adopted in other branches of engineering, as this has been found to be the next best size.

Designers, even men with reputations, have rarely had the courage to design a part so as to be a reasonable proposition for quick production in commercial quantities, the belief being that the factor of safety is determined solely by quality and workmanship, and they hesitate to incorporate the use of material of a commercial quality, and insist on the very finest limits; thus in the case of many parts connected to each other the safety factor is much higher in one than in the other.

It is surely possible for parts to be designed especially for simple and quick production without, of necessity, lowering the general factor of safety or increasing weight.

RESULTS TO FOLLOW.

There will be many serious difficulties in the way of the adoption of a standardisation policy, but these should not be allowed to affect the issue, and they can all be overcome by the adoption of a strong policy.

The problem of standardisation is a task which should commend itself to the enterprise and energy of the Society of British Aircraft Constructors, who represent the interests of the aircraft industry, and who can do great things in organising aircraft constructors with a policy of increasing and improving output during the war, and of making the production of aircraft a sound commercial proposition after.

This subject could be enlarged upon almost indefinitely, as, for instance, an intelligent and well-organised scheme for the "centralisation" of supplies of parts for aircraft, under which, in the case of an order for, say, one thousand machines distributed among twenty manufacturers, the same part for the whole of the order would be made by one or two firms, who would deliver these to a central clearing house whence manufacturers would draw their requirements. The subject is one which is materially effected by standardisation, and is worthy of an article to itself at a later date.

The immediate solving of the standardisation difficulty, and the combination of this with a scheme of "centralisation" of output, would provide a means of increasing, to nearly double, the output of aircraft without increasing the present available factory, machinery and labour facilities. As a matter of fact, under the scheme proposed, owing to the larger use of automatics, "man hours" can be easily replaced by "women hours," and the Army substitution scheme facilitated.

THE "AEROPLANE'S" SPECIAL NAVAL AND MILITARY ISSUES, 1917.

On January 3rd and 10th, "The Aeroplane" will produce its Special Naval and Military Issues. It has been decided to publish them both in January this year, so as to bring the complete record of the year's work into one volume, instead of splitting it between two volumes as occurred last year. These issues will contain a record of the aeronautical history of 1916, each month's events being divided into sections showing the Naval, Military, Foreign and Home Affairs of the period. The Naval Issue will contain an appreciation of the good work done by the active section of the R.N.A.S., a list of honours and special promotions won by the R.N.A.S., and a supplement on art paper illustrating "Seaplanes of 1916." The Military Issue will review the great activities and developments of the R.F.C., there will be a list of R.F.C. honours and promotions, and a supplement illustrating "Aeroplanes of 1916." In these issues there will also appear tables showing the progress of the various aeroplane records for speed, height, distance, and duration, from the earliest days of flying up to the outbreak of war. The usual features of the paper will also appear in their usual places, as well as some special articles.

Owing to the limitations of the supply of paper these Special Issues cannot be sent out broad-cast to newsagents, and judging by the success of the recent Airship Issue and the previous Naval and Military Issues, there will be a very great demand for them. It will, therefore, be advisable for readers to order them beforehand from their bookstalls, so as to avoid disappointment. Despite the greatly increased size of these Issues the price will remain as usual.—C. G. G.

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THE DURATION OF THE WAR.—(Continued.)

BY ROGER BAYONS.

The third determining factor referred to in the preceding article was "lack of food." This and the fifth factor, "public opinion," are closely interwoven, and the food question affects the latter in a close degree.

If one could believe, with any freedom, the statements made in the public prints published in Britain and in the Allied countries abroad, the enemy should be on the verge of disaster from lack of food at the present moment. A joyous, careless optimism is responsible for much more in life than is commonly admitted. The reverse of optimism is pessimism, but there is a middle course in which sanity can find its way.

In early days, when the human population of the world was less in number and life ran in simpler ways, each country was self-supporting in so far as necessities were concerned. Luxury even was possible without a great overseas trade. But as human material desires expanded it became more and more an essential of life that trade should be encouraged outside the national borders. Dreams became realities, and *pâté-de-foie-gras* took its due place in the national existence. Little by little luxuries became, in a degree, necessities, and people came to a belief that life was not endurable without the merchandise brought from afar in the national argosies. In the last century the interdependence of States became a fixed principle.

Germany, alone, unaided by kindred nations, would, under an effective blockade, have fallen before the completion of the first two years of war. This despite her careful accumulation of food in the previous years. The fruits of the earth would have failed her, and with a true starvation would have come submission to the desire of her enemies. A crushing victory of her armies in the first few weeks of the war would have been the only solution possible. But Germany rarely is impetuous. Thought, skilled thought, precedes every move, and anticipated victory is backed by measures capable of dealing with the unexpected, which, says Clausewitz, is always to be expected in war. Thus not only for greater initial force but for mutual maintenance, Germany entered into an offensive alliance with Austria, and later, when opportunity served, with Turkey and with Bulgaria.

In consequence, the Germanic Confederation is to-day self-supporting in food. Luxuries have gone because necessities form their basis, but of that which is necessary to keep life in the people there is no lack. The people are rationed, and the people are in consequence hungry, but it is probable that the death-rate is less and the national health better than in the preceding years. Eating tended to become too common a habit until war came with its health-giving properties.

Corn, the staple food of all peoples, is grown in great quantities throughout the nations of the German alliance. The most fertile land under cultivation in Europe lies within the enemy borders. Vast though the plains of Russia may be, they are largely unproductive, and none other of our Allies has sufficient produce to maintain its own people for more than two-thirds of any year. As in men so in land; there is little waste under German rule. Rumania, the last to fall under German domination, was the most fruitful in relation to size of the nations allied to us, and now her produce also has gone to the conqueror.

In the earlier days of the war there was a considerable reduction, partly through unusual carelessness, in the number of livestock in Germany and Austria. In consequence there is to-day little more meat available

than is sufficient for the adequate rationing of the troops in the field. Such surplus serves to keep the people at home in touch with the flesh-eating habits of the past. No more. Meat from abroad, from South America, is shut off by the blockade.

In other commodities there is an equal shortage. The efficiency of the nation will not necessarily be decreased in consequence, but the national comfort will almost cease to exist. The most important feature of the shortage of food as now prevailing in Germany is not the likelihood of starvation, but the effect on public opinion of the continued deprivation to the people of one-time necessities.

There are three possibilities:—

(1) The people may blame their lack of material comfort on the enemy. They have, so far, believed the war to have been engineered by Russia, France, and England, and the weight of all their ills may well be imputed to the same source. If so, the war will continue with a vigour inspired by bitterness.

(2) They may with an inversion of thought not uncommon amongst the masses lay their present discomfort to the charge of their rulers. As such a change in view is not gentle in demonstration, internal dissension would bring about the defeat of the Central Powers.

(3) They may regard it as a necessary evil of war, and, believing that their enemies are also in straits, accept the privations and wait for peace to come with victory to the Emperor's eagles. Probably with this spirit lassitude might become more prominent than enthusiasm, and defeat complete and final would be the result.

Of these possibilities the first is the most likely. Even to-day it does not seem to be understood in this country how strong is German unity. The rulers and people are at one in a manner more common with small growing nations than with mighty nations with a record of two generations of victory. Together the monarch, the army, and the nation at large have been educated and trained since the black days when Queen Luise alone had the spirit to defy Napoleon, the friend by force of arms of her husband Frederick William. Then with Clausewitz, von Gneisenau, von Scharnhorst, von Moltke, von Roon, Prince Friederich Karl, and so through the brilliant list, the nation came again to greatness. The Germans have not yet learnt to forget, and it is unlikely that disloyalty will find a home with the enemy. There is far more reason to believe that the enemy trials, if neither success nor defeat brings relief to them, will bring savagery into war until peace comes to the souls of Tilly, Alva, and Torquemada, because a greater cruelty than theirs has ravaged the earth.

Therefore, though lack of food in enemy countries will not in itself end the war, it may have an intimate relation to the causes determining the struggle.

Before the present war began, the "business man," a type held up for the admiration of the world by those who connect intellect with the acquisition of wealth, said with unctuous satisfaction that Europe would never again be disturbed by international bloodshed because "the financiers would not allow it." Many times one has been told of war averted during the years immediately preceding the present troubles by the heroic action of Jewish stockbrokers in refusing to permit the Powers to disturb the tranquillity of the national bourses. They told us, not in so many words, that "Honour" was a poor thing, but blessed was he who treated with due respect the art and manner of bartering. They told us, too, that with war would come financial ruin, and with

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financial ruin hopeless misery and poverty. War has come, and with it, not financial ruin, but a mere redistribution of wealth in rather quicker time than these same financiers had desired. Misery and poverty are with us, but in little greater degree than before. Those who then were rich are now poor in many cases, and those who were poor have acquired riches. There is therefore little reason to believe any of the popular financial sayings of pre-war days.

The Central Powers have no overseas trade, and but little business beyond their borders. Hence the rate of exchange of their money is of little importance, as exchange has almost ceased. A coin is still a token, and inside the walls of a nation it has no other symbolism or value. In Germany, twenty marks has the purchasing power of twenty marks to-day as in days of peace, even though in New York its value would be little more than thirteen marks. For this reason money will not shorten the war in so far as the Central Powers are concerned.

Public opinion is a power of little known capabilities. It has sometimes hanged the innocent in the place of the guilty, and it often corrects its errors centuries later. Public opinion burned Jeanne d'Arc because she possessed strange fascinations for victory, and public opinion a little later—five centuries—canonised her. Fickle and treacherous, rarely generous, it is, nevertheless, a vital power in these days of democracies.

In the present war there is little chance of a nation rising against its own chiefs and thereby giving the country to the enemy—except in the case of Greece, and it has not yet been decided by the Grecians which the enemy is to be. The danger is of the public opinion of one nation in either alliance fostering prejudice against the national allies, and so undermining that unity which

is strength. Unless the English, the French, the Russians, and the smaller people concentrate their thoughts on the success of the group and not on the isolated glory or worldly welfare of their own country, an indeterminate conclusion, or at the worst defeat, is the certain fate of the alliance. Similar conditions affect the Central Powers. The defection of one unit of the alliance will imperil the existence of the rest. Therefore it is the duty of the nations desiring victory to ensure friendship and mutual respect by a common effort and a common sacrifice that success may in the end bring an honourable peace. It is neither possible nor right to go into further detail in this matter in a public print.

The military position of the opposing forces is not such as to direct opinion in favour of either group of nations. Success visits each army in turn, but has so far dwelt a little longer with the enemy than is perhaps discreet or proper. A great area of territory normally a part of the territory of our Allies is now under German rule, and, despite the engagements on the Somme and in sections of the Russian front, the greater moves in the Near East have added to the captured lands rather than reduced the gains. The zenith of German success has either just been reached or is yet to come.

From the beginning of the war the entire strategy of the German army has been directed by one General Staff and by one Government. Throughout the theatre of war the decree of Berlin has been and is supreme. One policy has been followed. Duplication of moves, waste of personnel, confusion of dates, have all been avoided. One strategy and one war has been waged. With ourselves and our Allies each nation has carried on campaigns, possibly agreed on in common, but under separate direction and with differing objects. The days is past for a series of isolated wars. Unity alone carries victory in its train.

AIRCRAFT IN THE HOUSE.

On Dec. 14th, Mr. Pemberton-Billing (Hertford, Ind.) asked the Government not to take any definite decision as to the reconstruction of the Air Service until the House had had an opportunity of discussing the subject. He understood it was the intention of the Government to transfer aircraft construction to the Minister of Munitions. Against such a course he desired to enter a protest. To whom at the Ministry of Munitions were they going to give the direction of the work? Or was it the intention to lend to the Department experts from the Air Services of the Army or Navy? In his view the situation demanded the appointment of a special Aircraft Construction Board composed, preferably, of civilians.

The best method of defeating the submarine peril was the raiding of submarine bases from the air, not intermittent but continuous raids day by day. The necessary machines were to be had. There were facilities in this country for producing within six months 5,000 aeroplanes without interfering in any way with the making of other munitions of war. Thousands of aviators in training were constantly idle in the aerodromes of this country, waiting for favourable weather conditions to go up. He had been suggesting since December, 1914, that facilities should be provided for their training in the south of France. He trusted that before the end of the war a great Imperial Air Service would be brought into being.

* * *

On Dec. 18th the House of Commons went into Committee on the financial resolution connected with the New Ministries and Secretaries Bill. The resolution provides for the granting of the money to defray the expenses of the new Departments.

Sir G. Cave, in moving the second reading of the Bill, said, as the war proceeded, certain matters became more and more pressing and of vital importance. Among these matters which were to-day of that degree of importance were the questions of food, shipping, labour, and aircraft. It was necessary to put more strength into these matters, and the Government considered the obtaining of men of experience, who would give their undivided attention to these subjects, the best course.

It was proposed by the Bill to appoint a Parliamentary Secretary to the Air Board, but the Government desired to go somewhat further than that. This matter was of great and pressing importance, and many of them would desire to have a decision as to the position the Air Board was to take. He was authorised by the Prime Minister to say that in the pressure of work in-

volved in the formation of the Government it had not been possible to decide as yet all matters connected with the Air Board. The work of the President was still being carried on by Lord Curzon.

The Government had satisfied themselves that the Service was not suffering in the meantime, but he was glad to be able to say that the two fighting departments—the War Office and the Admiralty—had arranged to utilise to the full the services of the Air Board, and he hoped on the Committee stage to be able to introduce amendments to give effect to that decision. (Cheers.) All of them were in deadly earnest about the war. (Cheers.) They were determined to throw into it, without stint and without delay, all the strength and all the resources of this country.

CHIVALRY.

The Commandant of the prisoners' camp at Osnabrück (Hanover), where a number of captured British aviators are interned, has received the following letter from the father of Capt. Bölske, the famous pilot, in whose memory they had sent a wreath:—

Ziebig, near Dersau, Nov. 12th, 1916.

Sir,—You have been so kind as to send a wreath as last tribute for our son being killed while fighting for his country that had been dedicated by the British flying officers interned in the camp at Osnabrück.

We beg to thank you for having granted the wish of the interned gentlemen, and ask you to kindly inform them that their noble display of real chivalrous feeling has been received with heartfelt gratitude, and has left a splendid impression throughout Germany. Please God, that the chivalrous relations that have ever existed between German and British aviators, and that, to our delight, has often been displayed by our son, might soon move into the relations of the nations.—With heartfelt gratitude towards you and the interned British officers, yours very obediently.

(Professor) M. Bölske.

A PRESENTATION AEROPLANE.

The Secretary for the Colonies announces that a sum of £392 has been subscribed by the people of the Western Province of the Gold Coast, with a view to the provision of an aeroplane for presentation to the Royal Flying Corps through the Overseas Aircraft Fund. Of this sum £408 was contributed by the native employees of Prestea Block A Mine.

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NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Dec. 12th, 1916.

ADMIRALTY, Dec. 7th.

R.N.A.S.—Temp. Flt. Sub-Lt. B. J. W. Brady, transfd. to the permanent List of the R.N.A.S., Dec. 8th.

WAR OFFICE, Dec. 12th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Sqd. Comdr.—Maj. I. E. E. Edwards, R.A., from a Flt. Comdr., Dec. 1st.

Flt. Comdrs.—The appt. of Lt. (temp. Capt.) C. E. Wardle, Spec. Res., notified in the "Gazette" of Oct. 12th is antedated to July 1st. The appt. of Sec. Lt. (temp. Capt.) L. F. Hursthouse, Spec. Res., notified in the "Gazette" of Oct. 16th, is antedated to July 1st. From Flying Officers, and to be temp. Cpts. while so empld.:—Sec. Lt. (on prob.) E. J. L. W. Gilchrist, M.C., 9th Lrs., Spec. Res., Nov. 27th. Lt. B. P. G. Beanlands, Hamps. R., Dec. 1st.

Flying Officers.—Sec. Lt. (temp. Lt.) C. H. Davies, R. Highrs., T.F.; temp. Sec. Lt. C. R. W. Knight, Gen. List; Lt. G. E. R. Schon, M.C., S. Staff. R., from Machine Gun Corps, and to remain sec.; Sec. Lt. (on prob.) F. I. Fleming, Spec. Res.; temp. Sec. Lt. F. K. Crosbie-Choppin, Gen. List, Nov. 22nd. Lt. W. O. P. Winmill, Bedf. R., from a Flying Officer (Observer), with seny. from June 28th. Temp. Sec. Lt. R. J. Warner, Gen. List; temp. Sec. Lt. A. R. Johnston, Gen. List; temp. Sec. Lt. J. E. Lewis, Gen. List; temp. Sec. Lt. (on prob.) M. E. Woods, Gen. List, Nov. 23rd. Temp. Sec. Lt. C. S. Cravos, Welsh R., and to be transfd. to Gen. List; temp. Sec. Lt. (on prob.) H. C. Farnes, K.R.R.C., and to be transfd. to Gen. List; temp. Sec. Lt. G. M. Turnbull, Gen. List, Nov. 24th. Sec. Lt. H. A. Tracey, S. Wales Bord., and to be sec.; temp. Sec. Lt. T. S. Edleston, Gen. List, Nov. 25th. Sec. Lt. F. MacB. Paul, R. War. R., and to be sec.; Lt. V. I. Hardy, Suff. R., Spec. Res., and to be sec.; Sec. Lt. C. B. Riddle, Durh. L.I., T.F.; Sec. Lt. H. A. Cooper, Lond. R., T.F.; Sec. Lt. (on prob.) R. B. Love-more, Lond. R., T.F.; Sec. Lt. (on prob.) J. C. Rimer, Spec. Res., Nov. 26th.

Equipment Officers, 3rd Cl.—Temp. Sec. Lt. G. F. F. Col-lender, Gen. List, May 24th. Temp. Sec. Lt. F. Jefcoate, Suff. R., and to be transfd. to Gen. List, Nov. 10th. Temp. Sec. Lt. A. Wragg, Gen. List, Nov. 21st.

MEMORANDA.—The follg. Wt. Officers, from R.F.C., to be Sec. Lts. for duty with that Corps:—Sgt.-Maj. F. T. McElwee, Actg. Sgt.-Maj. C. J. Brockbank, Dec. 7th.

2nd Cl. Air Mech. C. Rayner to be temp. Sec. Lt. (on prob.) for duty with R.F.C., Sept. 28th. (Substituted for notification in "Gazette" of Oct. 11th.)

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. G. D. Rae resigns his commn., Dec. 13th.

TERRITORIAL FORCE.—A.S.C.—HIGH. DIVL. TRAIN.—Sec. Lt. (temp. Lt.) D. V. D. Marshall is now sec. for duty with the R.F.C., Oct. 4th.

* * *

From the "London Gazette" Supplement, Dec. 13th, 1916.

WAR OFFICE, Dec. 13th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Staff Officer, 3rd Cl. (Graded for pay as a Staff Capt.).—Temp. Capt. G. C. Anne, Yorks. L.I., T.F., Oct. 8th.

Flying Officers.—Temp. Sec. Lt. K. K. Muspratt, Gen. List, Nov. 2nd. Temp. Sec. Lt. A. Fraser, Gen. List, Nov. 8th. Temp. Lt. C. A. F. Whitley, M.C., R. Suss. R., and to be transfd. to Gen. List; temp. Lt. G. F. Westcott, Gen. List, from a Flying Officer (Observer), May 31st. Sec. Lt. G. W. Board. E. Surr. R., Spec. Res., and to be sec.; temp. Sec. Lt. B. G. King, Gen. List, Nov. 23rd. Temp. Sec. Lt. M. G. Cole, Gen. List; Sec. Lt. D. C. Cunnell, Hamps. R., T.F., Nov. 24th. Temp. Sec. Lt. T. S. Howe, M.C., Gen. List, from a Flying Officer (Observer), with seny. from May 30th. Lt. J. Butler, M.C., R. Ir. Fus., and to be sec.; temp. Sec. Lt. H. H. McIntosh, Gen. List; Sec. Lt. (on prob.) C. Sutton, Spec. Res., Nov. 25th. Sec. Lt. (temp. Capt.) M. B. Knowles, Lond. R., T.F., Nov. 26th. Temp. Sec. Lt. H. D. Davis, Gen. List; temp. Sec. Lt. H. S. Robertson, Gen. List; Sec. Lt. (on prob.) B. H. Godfrey, Spec. Res.; temp. Sec. Lt. V. F. Williams, Gen. List, Nov. 27th. Sec. Lt. (on prob.) A. Coningham, Spec. Res.; temp. Sec. Lt. T. A. Cooch, Worc. R., and to be transfd. to Gen. List, Nov. 28th.

Flying Officer (Observer).—Temp. Lt. W. O. T. Tudor-Hart, M.C., North'd Fus., and to be transfd. to Gen. List, June 25th. Adj. Temp. Capt. F. A. Forde, Gen. List, from a Brig. Maj., vice temp. Capt. F. R. Hedges, Gen. List, Oct. 11th.

Park Comdr.—Capt. F. Jolly, Spec. Res., from an Equipment Officer, 1st Cl., and to be temp. Maj. whilst so empld., Dec. 1st.

Equipment Officers, 2nd Cl.—From the 3rd Cl. and to be temp. Lts. whilst so empld.:—Sec. Lt. C. F. J. North, Spec. Res.; Sec. Lt. H. W. Mills, Spec. Res., Dec. 1st.

3rd Cl.—Sec. Lt. (on prob.) G. Barnett, Spec. Res., Nov. 7th. MEMORANDA.—To be temp. Capt.:—Temp. Sec. Lt. G. A. Houghton, for duty with R.F.C., Oct. 14th.

To be temp. Lts. while serving with R.F.C.:—Sec. Lt. R. L. Clegg, Lanc. Fus., Spec. Res.; temp. Sec. Lt. J. F. Alcock; temp. Sec. Lt. E. R. Cottier; temp. Sec. Lt. H. Thrower, Nov. 1st.

To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Petty Officer A. G. D. West, from R.N.V.R., Nov. 8th. Temp. Sec. Lt. F. W. Byrne, from Res. of Officers, R. Mar., Dec. 14th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) H. V. Phippen resigns his commn., Dec. 14th.

SPECIAL RESERVE.—R.F.C.—The probationary appointments of the following Sec. Lts. are cancelled, under the provisions of paragraph 221, Regulations for Officers of the Special Reserve:—H. Cockroft, W. J. Pike, G. N. B. Baynes, Dec. 14th.

TERRITORIAL FORCE.—INFANTRY.—GORDON HIGHLDRS.—Sec. Lt. R. L. M. Jack is sec. for duty with the R.F.C., Dec. 1st.

YORKS. R.—Maj. R. A. Constantine (Prov. Bn.) is now sec. for duty with the R.F.C., Nov. 1st.

* * *

From the "London Gazette" Supplement, Dec. 14th, 1916.

WAR OFFICE, Dec. 14th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Adjts.—Sec. Lt. (temp. Lt.) A. H. Stradling, Gordon Highrs., T.F., and to retain his temp. rank whilst so empld., vice Lt. R. Whitaker, Rif. Brig., Nov. 13th. Lt. R. C. Morgan, Canadian Art., Nov. 15th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) are confirmed in their rank:—B. H. Godfrey, A. Coningham, C. Sutton. To be Sec. Lts. (on prob.):—A. Glynne, Oct. 6th. D. R. Munro, Nov. 21st. A. W. Chapman, Nov. 27th. E. H. Wilding, Dec. 8th.

TERRITORIAL FORCE.—INFANTRY.—W. YORKS. R.—Sec. Lt. (temp. Capt.) A. Sowden is sec. for duty with the R.F.C., Nov. 1st.

GLOUCS. R.—Qr.-Mr. and Hon. Lt. H. Farquharson is sec. for duty with the R.F.C., Nov. 1st.

* * *

The King has been pleased to award the Military Medal for bravery in the field to the following man:—

G/26969 Sec. Cl. Air Mech. T. ROBINSON, R.F.C., late R. Innis. Fus.

* * *

From the "London Gazette," Dec. 15th, 1916.

ADMIRALTY, Dec. 12th.

With reference to the notice which appeared in the "Gazette" of Oct. 3rd of the grant of a temp. commn. as Flt. Sub-Lt. to W. H. Chisham, the name should be W. H. Chisam, and not as stated therein.

WAR OFFICE, Dec. 15th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flt. Co.ndr.—Capt. C. Cooper, R. W. Surr. R., Spec. Res., from a Flying Officer, Dec. 3rd.

Equipment Officers, 2nd Cl.—From the 3rd Cl.:—Lt. H. K. Maxwell, Spec. Res. and to be temp. Lts. while so empld.:—Sec. Lt. H. L. Saunders, Spec. Res., Nov. 1st.

INFANTRY.—LEIC. R.—Temp. Sec. Lt. W. Harris, from Gen. List (R.F.C.) to be temp. Sec. Lt. (attd.), Dec. 16th, seny. from Aug. 5th.

R. Suss. R.—Temp. Lt. H. S. Broughall relinquishes his commn. on appt. to R.N.A.S., Dec. 3rd.

TERRITORIAL FORCE.—R.F.C.—AIRCRAFT PARKS.—Lt. (temp. Capt.) R. Whiddington is sec. for duty with R.F.C., Nov. 25th.

R.E.—Sec. Lt. F. Baxter is sec. for duty with R.F.C., Dec. 6th.

* * *

A Supplement to the "London Gazette," dated Dec. 15th, contains the following announcement:—

The King has been pleased to appoint temp. Sec. Lt. Ian Vernon Pyott, R.F.C., a Companion of the Distinguished Service Order, in recognition of conspicuous gallantry and devotion to duty in connection with the destruction of an enemy airship.

* * *

From the "London Gazette" Supplement, Dec. 16th, 1916.

WAR OFFICE, Dec. 16th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers (Observers).—Temp. Lt. C. N. Jones, Notts and Derby R., Oct. 31st. Temp. Sec. Lt. C. Curtis, Midd'x R., and to be transferred to Gen. List, Nov. 5th. Temp. Lt. H. C. Benstead, N. Staff. R., T.F., Sec. Lt. (on prob.) F. S. Andrews, Spec. Res., Nov. 15th. Lt. J. C. Perkins, W. York. R., Spec. Res., Temp. Lt. A. P. Wilson, High. L.I., and to be transfd. to Gen. List;

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Sec. Lt. R. L. M. Jack, Gord. Highrs., T.F.; temp. Sec. Lt. (on prob.) G. W. B. Bradford, Gen. List (Dec. 1st).

Equipment Officers, 1st Cl.—Temp. Lt. (temp. Capt.) R. Whid-dington, Hamps. Aircraft Parks, T.F., and to retain his temp. higher rank whilst so empld., Nov. 25th.

3rd. Cl.—Temp. Sec. Lt. L. P. Ball, Gen. List, Oct. 1st. Sec. Lt. (on prob.) R. A. W. Collet, Spec. Res., Oct. 30th.

MEMORANDA.—Sec. Lts. to be temp. Lts. whilst serving with R.F.C.—J. E. H. Bibby, R. W. Fus.; F. Sowrey, D.S.O., R. Fus.; G. H. C. Crooke-Rogers, Worc. R.; E. P. Roberts, R. Suss. R.; T. C. H. Lucas, Suff. R.; H. R. Vagg, Som. L.I.; E. Page, Midd'x R.; C. R. Robbins, R.H. and R.F.A.; H. M. Golding, Glouc. R., Spec. Res.; B. N. Goudge, Leic. R., Spec. Res.; J. D. Canning, N. Staff. R., Spec. Res., Nov. 1st.

Sec. Lts. (on prob.) to be temp. Lts. whilst serving with R.F.C.—C. H. Knight, Dorset R., Spec. Res.; N. Brearley, M.C., L'pool R., Spec. Res.; D. G. A. Allen, Dur. L.I., Spec. Res., Nov. 19th.

Temp. Sec. Lts. to be temp. Lts. whilst serving with R.F.C.—N. L. Robertson, L. B. Williams, J. W. Shaw, Nov. 1st.

Flt. Sgt. F. Adams, from R.F.C. to be Sec. Lt. for duty with R.F.C., Dec. 17th.

Sgt. H. E. Hotchin, from R.F.C., to be temp. Sec. Lt. (on prob.) for duty with the Mil. Wing of that Corps, Dec. 5th.

TERRITORIAL FORCE.—N. STAFFS REGT.—Sec. Lt. H. C. Benstead is secd. for duty with the R.F.C., Nov. 15th.

* * *

From the "London Gazette" Supplement, Dec. 18th, 1916.

WAR OFFICE, Dec. 18th.

REGULAR FORCES.—STAFF.—The following temp. appointment is made at the War Office:—Staff Lt.—Sec. Lt. T. Coulburn, R.F.C., Spec. Res., from an Equipment Officer, 3rd Cl.

ESTABLISHMENTS.—R.F.C.—Flying Officers.—Sec. Lt. J. S. Brasell, Australian Flying Corps, Nov. 2nd. Sec. Lt. L. S. M. Page, R. E. Kent Yeo., T.F., Nov. 5th. Sec. Lt. A. T. Cole, Australian Flying Corps, Nov. 7th. Sec. Lt. (temp. Lt.) W. Smith, Lond. R., T.F.; Sec. Lt. (temp. Lt.) J. A. Middleton, E. Lan. Bdge., R.F.A., T.F.; Sec. Lt. T. B. Morris, R. W. Fus., T.F., Nov. 12th. Temp. Sec. Lt. A. N. Leckler, Man. R., and to be transfd. to the Gen. List, Nov. 13th. Temp. Sec. Lt. (on prob.) R. N. Dobbyn, Gen. List, Nov. 23rd. Temp. Lt. G. G. Moore, Gen. List, from a Flying Officer (Observer), Nov. 24th, seny. from June 21st. Sec. Lt. A. W. Hogg, Sco. Horse Yeo., T.F.; temp. Sec. Lt. E. R. Pennell, Gen. List; temp. Sec. Lt. H. P. Rushforth, Gen. List, Nov. 28th. Temp. Lt. W. F. Fletcher, Machine-gun Corps, and to be transfd. to the Gen. List; temp. Sec. Lt. S. Blair, from attd. 17th Lrs., and to be transfd. to Gen. List, Nov. 29th. Temp. Sec. Lt. A. C. Randall, Bord. R., and to be transfd. to the Gen. List; Sec. Lt. E. A. Packe, Oxf. and Bucks L.I., from a Flying Officer (Observer), with seny. from June 21st. Sec. Lt. (on prob.) W. F. Dobson, Spec. Res., Nov. 30th. Sec. Lt. D. J. Honor, W. Rid. Bdge., R.F.A., T.F.; Sec. Lt. (on prob.) V. T. Norminton, Spec. Res.; temp. Sec. Lt. (on prob.) A. Lindley, Gen. List; Sec. Lt. (on prob.) E. Armitage, Spec. Res., Dec. 1st.

Flying Officers (Observers).—Lt. C. Barry, R. Ir. R., and to be secd., Oct. 15th. Capt. S. R. Penrose-Welsted, R. Ir. R., and

to be secd.; temp. Capt. F. M. Hicks, 10th Hamps. R., and to be transfd. to the Gen. List; Lt. T. S. Ivens, Ches. R., and to be secd., Nov. 1st. Capt. B. G. M. F. Nixon, 41st Dogras, Ind. Army, Nov. 6th. Sec. Lt. (temp. Lt.) E. R. Wilkinson, North'd Fus., T.F.; Sec. Lt. J. F. Turner, Ches. R., T.F.; Sec. Lt. W. S. Reid, Sco. Horse Yeo., T.F.; temp. Sec. Lt. A. C. Stopher, Garr. Bn., R.W. Fus., and to be transfd. to the Gen. List, Nov. 10th. Sec. Lt. V. P. Turner, Australian Imperial Force, Nov. 12th. Temp. Sec. Lt. G. N. Goldie, Arg. and Suth'd Highrs., and to be transfd. to the Gen. List; Sec. Lt. A. H. Lancaster, Midd'x R., T.F.; temp. Sec. Lt. W. H. Winter, R. W. Surr. R.; temp. Sec. Lt. J. McDougall, Sea. Highrs., and to be transfd. to the Gen. List; Sec. Lt. H. W. Bowd, Australian Imperial Force; Sec. Lt. W. R. Hyam, Australian Imperial Force, Nov. 15th.

Equipment Officers, 3rd Cl.—Sec. Lt. H. C. S. Bullock, Gen. List, Oct. 19th. Sec. Lt. F. Baxter, Kent Fortress Engrs., R.E., T.F., Dec. 6th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—To be Sec. Lts. (on prob.)—J. T. Rossiter, Aug. 1st. R. Lyon, C. N. Le Mercier, I. C. Macgregor, J. A. Paull, L. Cummings, A. C. Hurst, J. B. Carling, J. A. M. Fleming, C. C. Caldwell, A. I. Murphy, C. B. Fisher, L. J. Scott, H. W. Price, W. L. Harrison, A. V. McPhail, J. H. F. Hambly, R. G. Hamilton, B. B. Perry, G. J. T. Young, J. M. Smith, D'A. F. Hilton, H. O. McDonald, G. B. MacQuarrie, F. W. Curtis, W. P. Scott, D. French, J. L. Boles, G. W. Curtis, M. Montesole, W. H. St. J. Perram, R. M. Smith, E. M. V. Fielding, Nov. 21st. F. Cain, Dec. 2nd. E. W. Brooks, T. Moore, R. H. Grant, A. T. Crook, R. A. Trelease, F. A. Thomas, J. Y. Watson, Dec. 8th. R. C. S. Jamie, Dec. 14th.

TERRITORIAL FORCE.—YEOMANRY.—Sec. Lt. A. E. L. Skinner is secd. for duty with R.F.C., Nov. 9th. Sec. Lt. W. S. Reid is secd. for duty with R.F.C., Nov. 10th. Sec. Lt. A. W. Hogg is secd. for duty with R.F.C., Nov. 28th.

R.F.A.—Sec. Lt. D. J. Honer is secd. for duty with R.F.C., Dec. 1st.

INFANTRY.—R. W. Surr. R.—Sec. Lt. (temp. Lt.) E. A. Stewardson is secd. for duty with the R.F.C., Nov. 28th.

NORTH'D Fus.—Sec. Lt. (temp. Lt.) E. R. Wilkinson is secd. for duty with the R.F.C., Nov. 10th.

CHES. R.—Sec. Lt. J. F. Turner is secd. for duty with the R.F.C., Nov. 10th.

ESSEX R.—Capt. E. W. Broadberry is secd. for duty with the R.F.C., Nov. 8th.

MIDD'x R.—Sec. Lt. A. H. Lancaster is secd. for duty with the R.F.C., Nov. 15th.

LOND. R.—Sec. Lt. G. R. Beck is secd. for duty with the R.F.C., Nov. 28th.

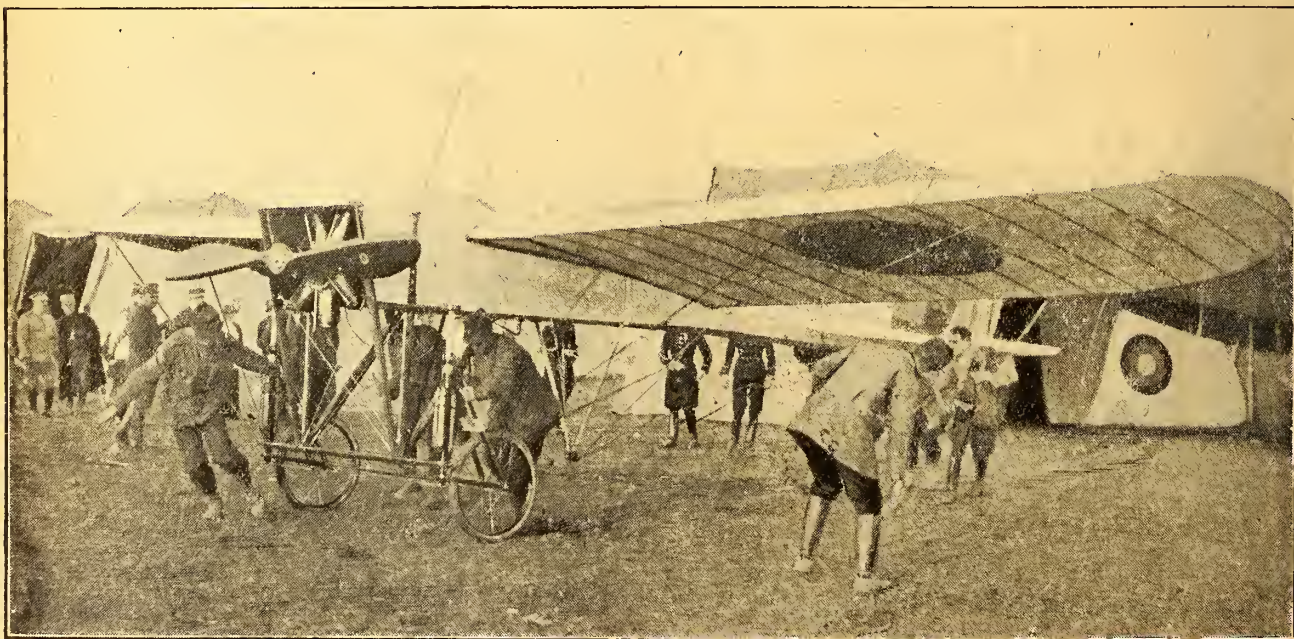
FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Dec. 13th.

The following Officers had the honour of being received by the King this morning, when His Majesty conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.

Flt. Lt. CHARLES FREEMAN, R.N.A.S.



OFF ON RECONNAISSANCE.—An officially viséd photograph of a Roumanian aeroplane being brought out from its tent at Bukarest. Readers of Volume I of "The Aeroplane" will recognise the machine as a 1911 type Blériot, which does not indicate high modernity in the Roumanian Aviation Service. Wings of an antiquated Nieuport type may be seen at the back.

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THE MILITARY CROSS.

Capt. STEPHEN PRICE, R.F.C.
Lt. ALEXANDER MACDONALD, Black Watch, att'd. R.F.C.
Sec. Lt. FRED LIBBY, R.F.C.

* * *

BUCKINGHAM PALACE, Dec. 16th

The following Officer had the honour of being received by His Majesty, when the King invested him with the Insignia of Companion of the Order into which he has been admitted:—

THE DISTINGUISHED SERVICE ORDER.

Capt. JOHN KELLY, Wiltshire Regt. and R.F.C.
His Majesty then conferred decorations as follows:—

THE VICTORIA CROSS.

Major LIONEL REES, Royal Artillery and R.F.C.

For conspicuous gallantry and devotion to duty. Whilst on flying duty Maj. Rees sighted what he thought to be a bombing party of our own machines returning home. He went up to escort them, but on getting nearer discovered they were a party of enemy machines, about 10 in all.

Maj. Rees was immediately attacked by one of the machines, and after a short encounter it disappeared behind the enemy lines, damaged.

Five others then attacked him at long range, but these he dispersed on coming to close quarters, after seriously damaging two of the machines. Seeing two others going westwards he gave chase to them, but on coming nearer he was wounded in the thigh, causing him to lose temporary control of his machine. He soon righted it and immediately closed with the enemy, firing at a close-contact range of only a few yards until all his ammunition was used up.

He then returned home, landing his machine safely in our lines.

BAR TO THE MILITARY CROSS.

Lt. MALCOLM BEGG, Rifle Brigade and R.F.C.

THE ALBERT MEDAL.—FIRST CLASS.

Lt.-Col. CYRIL NEWALL, Gurkha Rifles, Indian Army, attached R.F.C.

A fire broke out inside a large bomb store which contained high-explosive bombs—some of which had very large charges—and a number of incendiary bombs which were burning freely. Lt.-Col. (then Maj.) Newall at once took all necessary precautions, and, assisted by 2nd Class Air Mechanic Edward Simms, poured water into the shed through a hole made by the flames. He sent for the key of the store, and with Cpl. Henry Hearne, 1st Class Air Mechanic Harrie Stephen Harwood and Simms (to whom Medals have been awarded) entered the building and succeeded in putting out the flames. The wooden cases containing the bombs were burnt, and some of them were charred to a cinder.

NAVAL.

The following appointments have been made in Royal Naval Air Service:—

Dec. 13th.—The following have been entered as Proby. Flt. Officers (temporary), seny. Nov. 7th:—R. F. P. Abbott, W. C. Johnston, N. I. Larter, and P. W. Jenckes.

Mr. G. H. Murphy, granted tempy. commn. as Lt. (R.N.V.R.), seny. Dec. 11th.

Dec. 16th.—The following have been entered as Proby. Flt. Officers (temp.), seny. as stated:—E. T. Langdon and J. F. S. Vaughan, Nov. 3rd. R. T. Eyre and F. S. Strathy, Nov. 5th. C. Becker, H. C. Gooch, W. A. N. Davern, J. H. Norman, C. C. Inderwick, J. N. McAllister, S. F. Everson, and D. F. Murray, all Nov. 17th; and L. D. Bawlf, Dec. 14th.

Dec. 18th.—Wt. Officer (2nd Grade).—J. C. Stevens, promoted to Proby. Flt. Officer, seny. Dec. 13th.

Dec. 19th.—Mr. W. P. Rogers granted a temp. commission as Lt., R.N.V.R., and appointed to the "President," for R.N.A.S., to date Dec. 16th.

The following have been granted temp. commissions as Lt. (R.N.V.R.), seny. Dec. 16th, and app'd. to "President," add., for R.N.A.S.:—W. P. Rogers, G. J. Pickthall, G. G. Shepherd, A. Gord, and B. A. Castle.

* * *

ADMIRALTY COMMUNIQUÉ.

Dec. 16th.—On the 14th inst. a squadron of naval aeroplanes carried out a bombardment of Kuleli-Burgas Bridge, south of Adrianople. A great weight of bombs was dropped, and extensive damage is believed to have been done.

On the 15th instant an attack was carried out by a squadron of naval aeroplanes upon Razlovci (37 miles east of Istip, Serbia). A large number of bombs were dropped with effect, many hits being observed.

* * *

It is understood that men over military age are required for the R.N.V.R. Anti-Aircraft Corps, to relieve men who are fit for general service abroad. The headquarters are now at 4, Whitehall Gardens, where conditions of service may be obtained.

THE CASUALTY LIST.

Reported Dec. 14th.

KILLED.—Hume, Flt. Lt. John D., R.N.
ACCIDENTALLY KILLED.—Trapp, Flt. Sub-Lt. Stanley V., R.N.
ROYAL NAVAL DIVISION.—MISSING.—Heald, Lt. Ivan, R.N.V.R.

Reported Dec. 18th.

ACCIDENTALLY INJURED.—Collett, Flt. Lt. Ralph H., D.S.C., R.N.

Everitt, Mr. James P., Flt. Officer, R.N.

* * *

PERSONAL NOTICES.

DEATHS.

HEALD.—Owing to some curious error, for which this paper is not responsible, Mr. Heald, R.N.V.R., reported missing in the Casualty List of Dec. 14th, and unofficially reported killed, appeared as an unofficial R.F.C. casualty last week. It would appear that, probably, he was an R.N.V.R. observer, attached R.N.A.S., and that some member of his family, on receiving news unofficially of his death, reported to the Press that he was an R.F.C. officer.

* * *

HUME.—Flt. Lt. John Douglas Hume, R.N., who has been killed, was the only son of the Rev. David Hume, M.A., Buckhaven, Fife. He was 20 years of age, and was serving his time as an engineer when war broke out. Last spring he was attached to the Persian Gulf Expedition, and had several exciting adventures before his health broke down. Latterly he was on duty in this country.

* * *

MARRIAGES.

MILLAR—ALLEN.—On Dec. 9th, Flt. Sub-Lt. Ivan Paul Millar, R.N.A.S., was married to Katie, youngest daughter of Mr. and Mrs. William Allen, The Tower House, Croydon, at St. Augustine's, South Croydon.

* * *

ROSS—KINNARD.—The marriage took place on Dec. 12th, at St. Saviour's, Westgate-on-Sea, of Lt. Robert Peel Ross, R.N. (Squadron Commander, R.N.A.S.), only son of the Rev. R. Peel Ross and Mrs. Peel Ross, of Druiem, Inverness, and grandson of the late Capt. Horatio Ross, of Rossie Castle, Montrose, to Miss Muriel Kinnard, youngest daughter of Mr. E. H. Kinnard and Mrs. Kinnard, of Cleveland, Westgate-on-Sea.

The bride was given away by her father, and Flt. Comdr. C. Butler, R.N.A.S., was best man.

* * *

BIRTHS.

GREGG.—On Dec. 13th, at 47, FitzGeorge Avenue, West Kensington, to Winifred, wife of Lt. Basil Gregg, R.N.A.S.—a son.

* * *

LEESTON-SMITH.—On Dec. 12th, at Waverley, St. Luke's Road, Torquay, to Dorothy, wife of Cyril Napier Leeston-Smith, late Flt. Sub-Lt. R.N., of a son.

* * *

WARRINGTON-STRONG.—On Dec. 16th, at 3, Harvard Court, West Hampstead, N.W., the wife of Flt. Lt. F. Warrington-Strong, R.N., of a son.

MILITARY.

G.H.Q. COMMUNIQUÉ.

Dec. 12th.—10.12 p.m.—Yesterday three enemy aeroplanes were accounted for, one of which fell inside our lines. One of our machines is missing.

* * *

WAR OFFICE COMMUNIQUÉS.

The General Officer commanding the British Forces in Greece reports:—

Dec. 13th.—On the Struma front our aircraft reconnaissances continue.

* * *

The General Officer commanding the British Forces in Mesopotamia reports:—

Dec. 16th.—During the night of the 14th-15th our aeroplanes, flying by moonlight, successfully attacked the pontoon bridges on the Tigris, which the enemy had removed from their sites and was towing up-stream. The matériel was broken up and scattered.

* * *

The General Officer commanding the British Forces in Greece reports:—

Dec. 18th.—Our aeroplanes dropped bombs on Tumba station (south-east of Seres), and inflicted damage on some enemy transport on the Ghevgegi-Tcherniste (west of Lake Doiran) road.

* * *

THE CASUALTY LIST.

Reported Dec. 13th.

KILLED.—Crompton, Sec. Lt. H. D., R.F.A. and R.F.C.
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Speer, Lt. A. H. T. L., R.F.A. and R.F.C.
Wedgwood, Sec. Lt. W. A., R.E. and R.F.C.

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Reported Dec. 14th.

KILLED.—Crowther, Capt. L. O., R.F.C.
 WOUNDED.—Fanstone, Sec. Lt. A. B., R.F.C.
 Murdoch, Lt. D. M., Essex Regt., and R.F.C.
 PREVIOUSLY REPORTED PRISONER, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Tibbetts, Sec. Lt. J. L., R.F.C.

Reported Dec. 15th.

KILLED.—Tillard, Capt. T. A., Yeomanry and R.F.C.
 MISSING.—Johnson, Sec. Lt. D. S., Cyclist Co., Div. Mtd. Troops, and R.F.C.
 PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Stewart, Lt. D., R.G.A. and R.F.C.
 MISSING.—R.F.C.—Evans, 25178 Sgt. R. S. (Herne Bay).

Reported Dec. 16th.

KILLED.—Morgan, Sec. Lt. C. E., R.F.C.
 PREVIOUSLY UNOFFICIALLY, NOW OFFICIALLY REPORTED KILLED.—Barton, Sec. Lt. R., R.F.C.
 PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED AS A PRISONER IN GERMAN HANDS.—Mowat, Sec. Lt. M. M., R.F.C.
 PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Crisp, Sec. Lt. A. R., R.F.C.
 PREVIOUSLY REPORTED PRISONER, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Bowring, Sec. Lt. J. V., S. Lancs. Regt and R.F.C.

Reported Dec. 18th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Mann, Lt. J. A., M.C., Cameronians and R.F.C.
 WOUNDED.—Gilchrist, Sec. Lt. E. J. L. W., M.C., Lancers and R.F.C.
 Grenfell, Capt. E. O., M.C., R.G.A. and R.F.C.
 PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Heppell, Sec. Lt. P. F., R.F.A. and R.F.C.
 Nicholson, Lt. G. H., R.F.C.
 Ordish, Sec. Lt. B. W. A., R.F.C.
 Watts, Sec. Lt. R., R.F.C.
 Willsox, Sec. Lt. W. T., W. Yorks Regt. and R.F.C.
 KILLED.—R.F.C.—Allardice, 5385 1st Cl. Air Mech. A. (War-rington).

Reported Dec. 19th.

KILLED.—Barr, Sec. Lt. H. C., R.F.C.
 Dampier, Sec. Lt. G. W., R.F.C.
 WOUNDED.—Davies, Sec. Lt. R. B., Northumberland Fus. and R.F.C.
 Willmetts, Sec. Lt. S., R.F.C.

PERSONAL NOTICES.

DEATHS.

BROOKE.—Lt. Arthur Gailburn Brooke, R.F.C., youngest son of Mr. J. M. Brooke, of Childerley Hall, Cambridgeshire, Chairman of the Chesterton Board of Guardians, who was accidentally killed on Sunday last, was born in 1892. He was educated at Chigwell School, Essex, and at the Leys School, Cambridge. Five years ago he went to Canada, but returned on the outbreak of war, and enlisted in the Northants Yeomanry. After serving in the trenches in France for more than a year, he joined the R.F.C. and obtained his commission in March last. His only surviving brother, Lt. B. Brooke, has been at the front almost continuously since the outbreak of the war.

* * *

EDWARDS.—Sec. Lt. George Edwards, R.F.C., previously reported missing, now officially reported killed while flying over the German lines on Sept. 24th, was the second son of the late George Edwards, 134, Kingsland Road, N.E., and of Mrs. Edwards, "Cedar Mount," Mottingham, Kent. His age was 28.

* * *

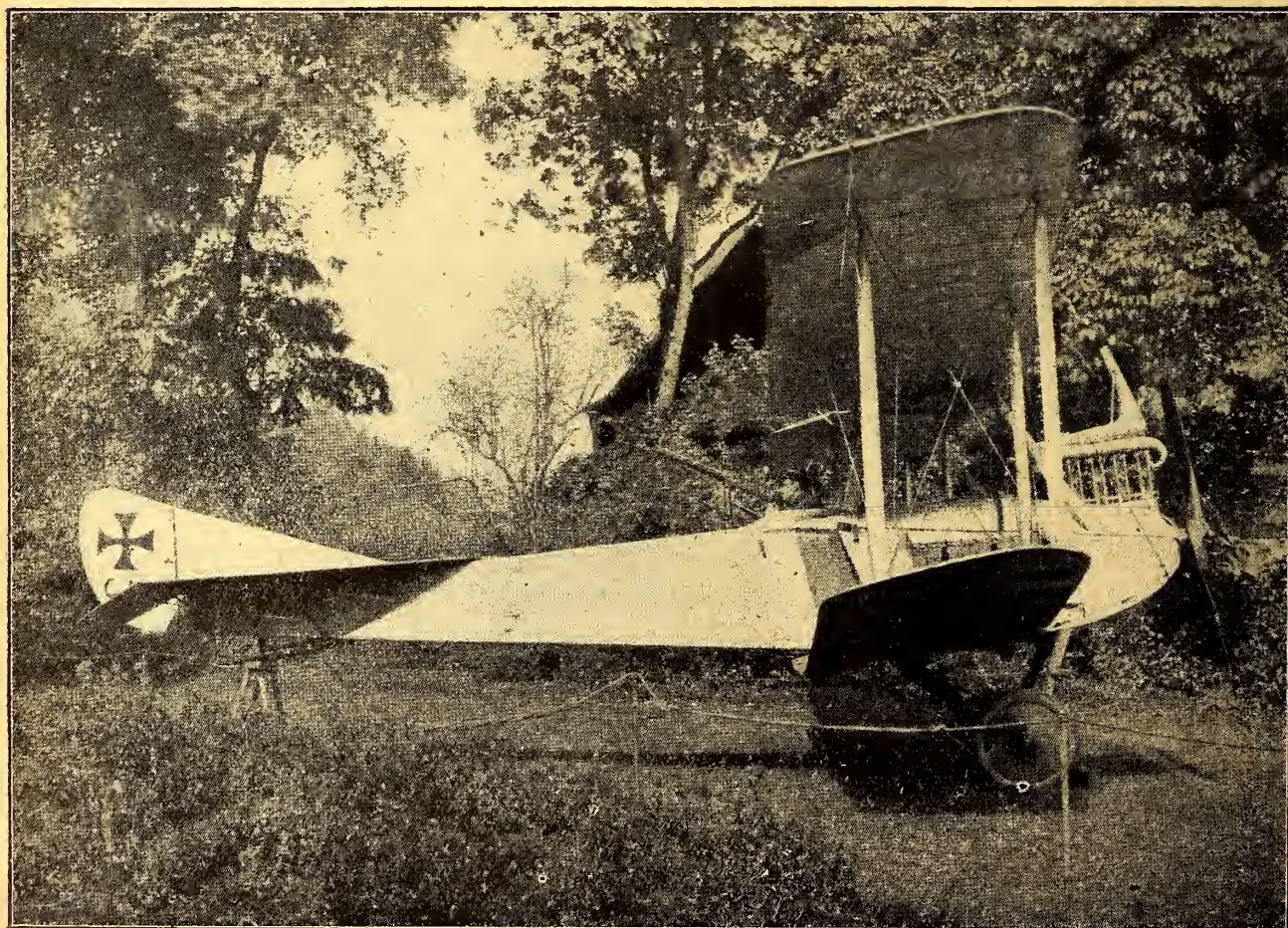
HEDDERWICK.—Sec. Lt. Guy Hedderwick, Dragoon Guards, attached R.F.C., previously reported missing on Sept. 22nd last, now officially reported as having died, aged 22, was the eldest son of Mr. Philip Hedderwick, of the firm of Stanley, Woodhouse, and Hedderwick, solicitors, of Essex Street, Strand. He was educated at Uppingham, and was articled to Messrs. Budd, Johnson, and Jecks, of 24, Austin Friars, solicitors. On the outbreak of war he joined the Westminster Dragoons, and served with that regiment in Egypt for one year. In August, 1915, he was gazetted Sec. Lt. in the First Reserve Cavalry, and transferred to the R.F.C. in May last. He joined a squadron at the front on Sept. 7th, and was engaged in an offensive patrol on Sept. 22nd, when he was attacked by several enemy aircraft at the same time and forced to the ground in the German lines. His C.O. writes that he put up a very good fight.

* * *

HERMAN.—Sec. Lt. R. Douglas Herman, South Lancashire Regt., attached R.F.C., who died of wounds in the German Field Lazarett, A. K. Epehy, on Sept. 22nd, was the son of W. Douglas Herman, Rainhill, Lancashire. He was aged 24.

* * *

TIDSWELL.—Capt. Cecil Robert Tidswell, Dragoons and Flt. Comdr., R.F.C., previously reported missing after an air raid behind the German lines, now reported killed, on Oct. 16th,



(Reproduced by courtesy of the French technical Journal "L'Aerophile," from a photograph lent by the French Service d'Aviation Militaire.)

A captured German L.V.G. biplane, type P.F., with upward exhaust pipe.



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was the only son of Mr. and Mrs. R. H. Tidswell, of Bosmer Hall, Needham Market, and 49, Wilton Crescent, S.W. He was 36 years of age.

MARRIAGES.

HOWELL—RUSSELL.—The marriage of Charles Hurd Howell, Lt., R.F.C., and Margaret Russell, daughter of the late ex-Governor William E. Russell, of Cambridge, Massachusetts, U.S.A., and of Mrs. Michael Foster, of Harrogate and San Remo, took place at 12.30, on Dec., 19th, at Holy Trinity Church, Cambridge.

* * *

WILKINSON—SNELL.—The marriage arranged between Capt. Alan Machin Wilkinson, D.S.O., Hampshire Regt., and R.F.C., and Miss Lina Snell took place at St. Barnabas Church, Addison Road, Kensington, Monday, Dec. 18th, at 2.15 p.m.

ENGAGEMENT.

BRYANS—RAMSBOTHAM.—The marriage of Capt. W. B. Bryans, Norfolk Regt., attached R.F.C., younger son of Mr. and Mrs. A. Bryans, 8, Talbot Square, Hyde Park, with Mildred Isobel, youngest daughter of the late Lt. T. Ramsbotham, R.N., and of Mrs. Ramsbotham, Enniskerry, Exmouth, will take place on Jan. 20th, at 2.30, at St. James's, Sussex Gardens, W. No invitations will be sent, but all friends will be welcomed at the church.

An Army Order, dated the 15th inst., contains the text of a Royal Warrant announcing that flying pay at the rate of 2s. a day may be issued continuously to qualified non-commissioned officers or air mechanics (within limits to be determined by the Army Council) who are specially selected for continuous employment on observation duty, provided that flying pay under this Article shall not be issuable concurrently with flying pay under Article 850.

One records with great pleasure that Capt. T. Mapplebeck, the King's (Liverpool) Regt., reported missing some weeks ago, is now believed to be a prisoner in Germany, a cheque having been received by his London banker from him, though no letter has arrived at the time of writing. Capt. Mapplebeck is a brother of the late Capt. Gilbert Mapplebeck, D.S.O., also of the King's Regt., who was one of the first R.F.C. officers to distinguish himself in the war, and who was killed when flying a Morane at Dartford in 1915.

* * *

Professor Anderson, President of Galway University College, has received news that his son, Lt. Lex Anderson, R.F.C., is a prisoner of war. It was feared that Lt. Anderson had been killed some weeks ago while flying over the German lines with Lord Lucas, who lost his life. No details are known as to how Lt. Anderson, who was Observation Officer, escaped.

* * *

It is reported from Berne that among a party of British officers and men who were prisoners in Germany and have been transferred to Switzerland are the following:—

Lt. John Firstbrook, R.F.C.
Sec. Lt. John Macfie, R.F.C.
Sec. Lt. Macaskie, R.F.C.

* * *

An officer of the R.F.C. writing to a friend in England says:—“Everybody seems to like Le Rhône, and in 180 hours' flying on Moranes I have only had four forced landings due to engine failure, three at aerodromes, and the fourth in a trench about 9 ft. deep and 10 ft. wide at — after the strafe, when, of course, the place was all cut up with enormous shell holes. We made a complete 'dog's dinner' of the machine that time—smashed wing, fuselage, and tail. Ourselves and the engine and 'prop.' were all right. The Morane is a splendid machine to get smashed up in. I have seen the most unholy 'crashes' without any damage to the pilot or observer.”

AIR BOARD REPORTS.

The following notes were issued by the Air Board for publication on Dec. 19th:—

Nov. 14th.—Ten of our pilots carried out a series of successful raids by night. Stations and rolling stock were attacked with bombs, two of which hit a moving train, bringing it to a standstill.

Nov. 16th.—Six of our machines bombed an enemy railway station. Six coaches were blown off the lines and two station buildings destroyed. Other rolling stock was damaged.

Nov. 21st.—One of our machines (Capt. “B” and Lieut. “H”), from a height of 500 ft., dropped three bombs on some enemy lorries. The bombs having missed, the machine turned and flew over the lorries again and dropped three bombs in the middle of them. Turning again, our observer turned his machine-gun on the enemy from a height of 150 ft.

According to statements made by some prisoners of a German artillery regiment, large numbers of the enemy guns have been

put out of action by direct hits, and they ascribed this to the accurate work of our air observation. Gun crews often had to retire and leave their guns for hours at a time.

FRANCE.

OFFICIAL COMMUNIQUÉS.

DEC. 12th.—THE ARMY OF THE ORIENT.—An enemy aeroplane has been brought down on the Struma front. Our aircraft bombarded the enemy cantonments in the Doiran region and in the Vardar Valley.

DEC. 13th.—A German captive balloon was destroyed by the fire of our artillery near Bouvaucourt.

THE ARMY OF THE ORIENT.—An enemy aeroplane, compelled to land, was captured by an Italian detachment. The two officers in the machine were taken prisoners.

DEC. 15th.—Notwithstanding the unfavourable weather, our Air Service took a brilliant part in the fighting.

ARMY OF THE ORIENT.—The Allied Air Service displayed great activity. One enemy machine was brought down south of Petrik.

DEC. 18th (evening).—An enemy aeroplane dropped five bombs on Vieux Thann. No damage was done.

* * *

A message from Havre states that two German aviators landed on the Plateau de Rouelle on Dec. 12th. They were taken prisoners by some British soldiers.

* * *

The “Morning Post” correspondent with the French Army says:—The French High Command, in close collaboration with the British, has been steadily, in the field and behind the lines, devising a system capable of ending to the Allies' advantage the deadlock temporarily produced by the successful German defensive on the present trench line. The basis of such a system events have shown must be a very great artillery superiority over the enemy at the point attacked. This superiority depends not merely on the weight of metal but also on a mastery of the air, without which the gunners are blind. It is in this matter of the Air Services that surprises are most to be apprehended, since the aeroplane is still in its infancy, and for this reason the French are sparing no pains and no ingenuity to strengthen their air fleet and to maintain their superiority over the Germans.

An interesting instance of the manner in which the Allies are steadily adapting old methods and inventing new methods to meet the new conditions is given by the way in which they have dealt with kite-balloons. At the beginning of the war the enemy was well provided with this means of aerial observation, and I well remember in the French lines how annoying it was to feel German eyes continuously upon one. There might be five or six German “drachen” in the air and not a single one on our side.

The French at once began to construct kite-balloons and train observers until in this respect they were as well or better provided than the enemy. Then they set to work to discover a method of destroying the enemy's balloons. Just before the battle of Champagne a German “drachen” was brought down by an aeroplane armed with a small gun firing an explosive shell, and this success had very considerable results, since it shook the confidence of the enemy's observers and made them far more cautious in running up their balloons.

Then the rocket system was invented, and proved so successful on the Somme and also at Verdun that the enemy, after losing a number of balloons, only ventured to use them at a considerable distance from the front lines, and then only left them in the air for the shortest possible time. The Allies on their side had such command of the air that they could run up their balloons as they pleased, and the tables were entirely reversed.

On the Somme front one would see perhaps 20 or 30 French and British kite-balloons quite near the front trenches, while far away, in the mist behind the lines, there would only be one or two German “drachen” to reply to them.

GERMANY.

OFFICIAL COMMUNIQUÉ.

DEC. 18th.—Enemy columns retreating to Braila were attacked with visible effect by our air squadrons.

RUSSIA.

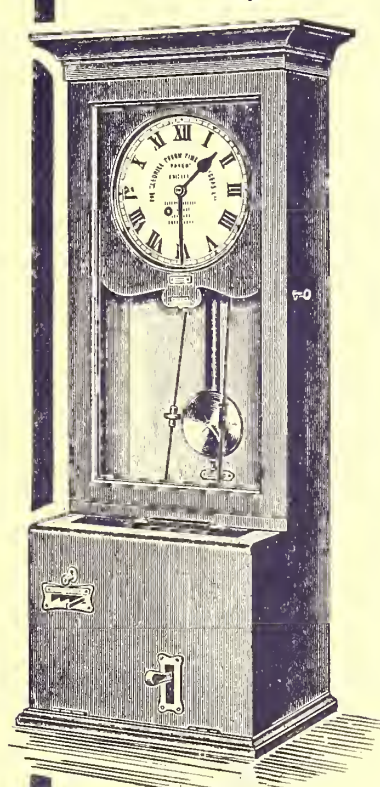
OFFICIAL COMMUNIQUÉS.

DEC. 14th.—GALICIA.—Our aeroplanes successfully dropped bombs on the Pluhov station on the Tarnopol-Zloczow railway, and on a supply unit near the village Nuszcz, which is north-east of this railway.

DEC. 15th.—Yesterday our aeroplanes fought three aerial actions in the region of Zalovce, Luchce, and Mlynovce, and on each occasion drove back the enemy to his own lines.

DEC. 16th.—We were bombarded in turn by the shore batteries, and attacked by seaplanes and a submarine, but the enemy gained no result.

DEC. 18th.—In the region of Boldura an enemy balloon was carried behind our lines by the wind. There is no information regarding its descent.



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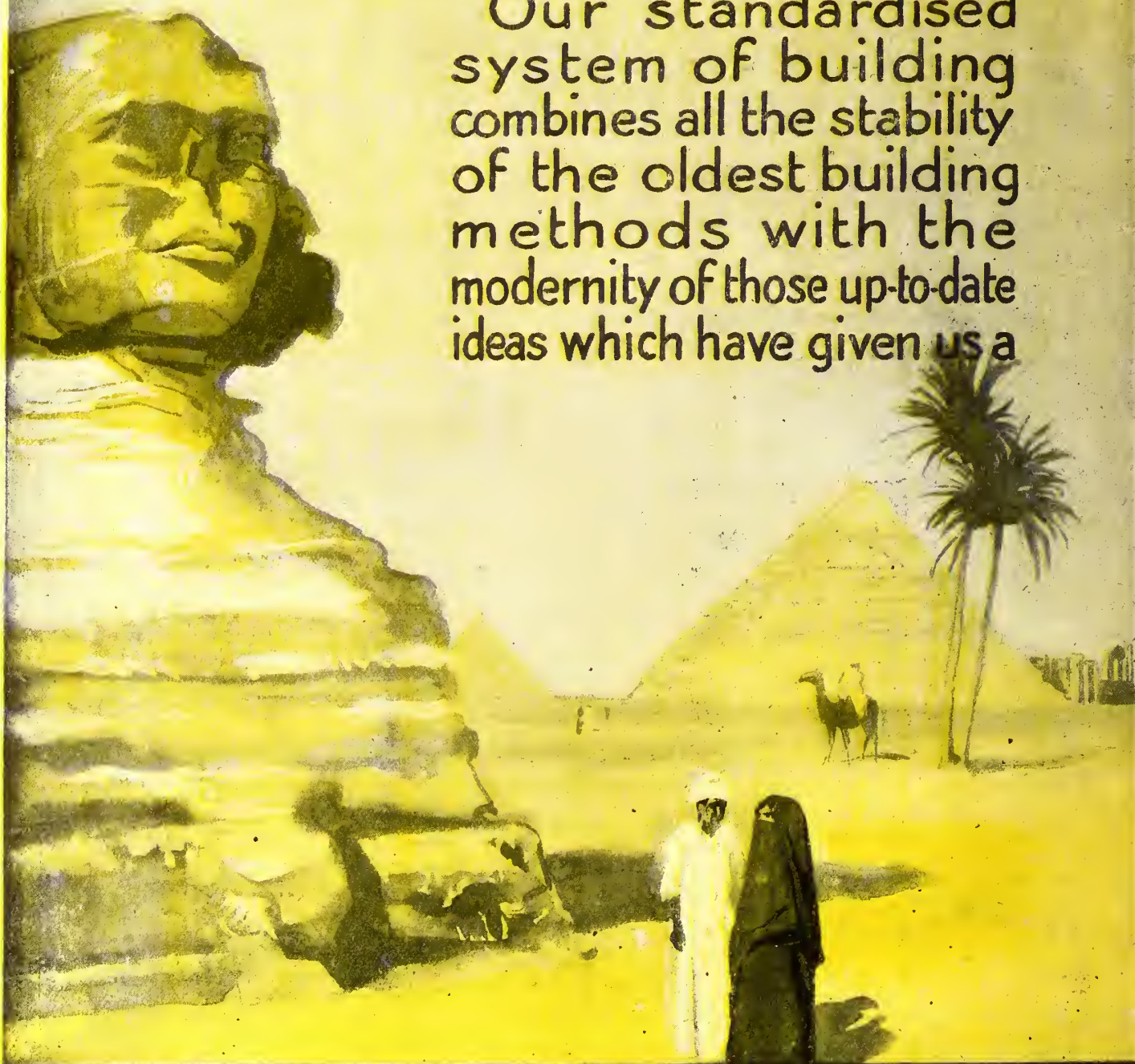
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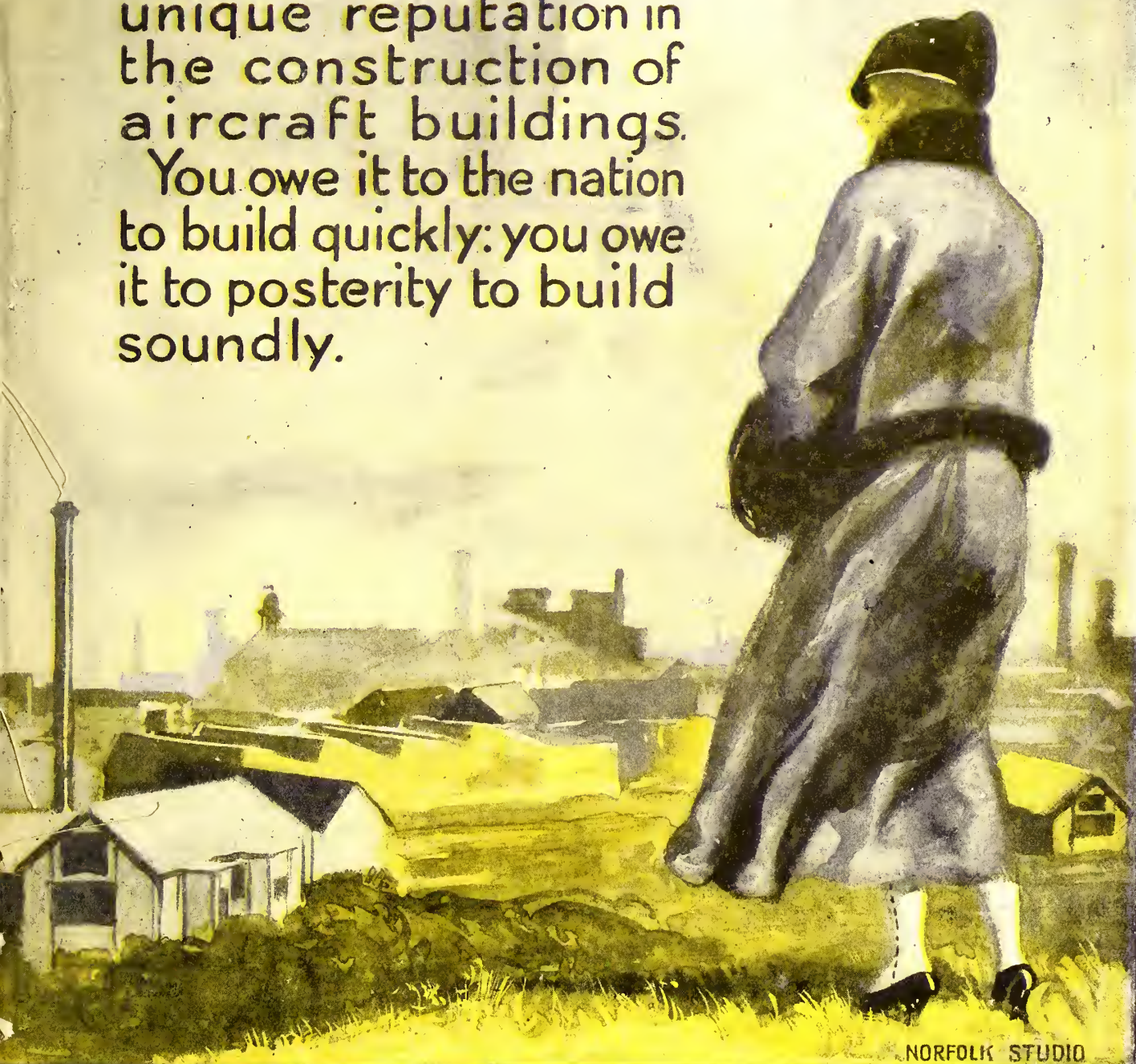


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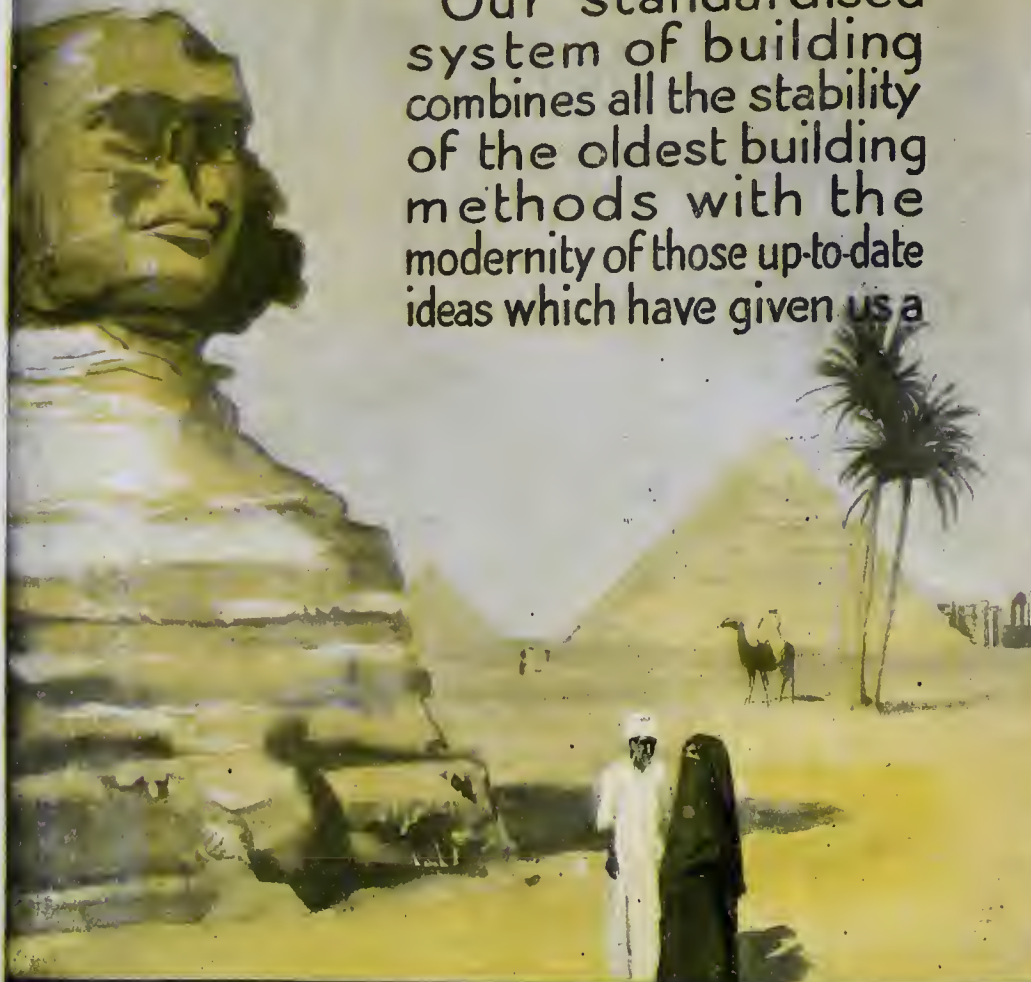
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

AUSTRIA.**OFFICIAL COMMUNIQUÉ.**

Dec. 14th.—Austro-Hungarian aviators shot down an enemy battle aeroplane over Commanesci. The machine turned upside down and crashed into a wood.

ITALY.**OFFICIAL COMMUNIQUÉ.**

Dec. 13th.—Along the Julian front artillery actions and patrol reconnaissances took place. On the Carso one of our aeroplanes attacked an enemy kite-balloon, which fell in flames near Ternowizza (Ternwica), north-east of Nabresina.

TURKEY.**OFFICIAL COMMUNIQUÉS.**

Dec. 11th.—On the Tigris front our aeroplanes successfully dropped bombs on an enemy airshed, and forced two aeroplanes to descend.

Dec. 16th.—South of our position at Fellahieh (on the Tigris) we repulsed strong troops of enemy cavalry, and at the same time shot down by our fire one of his aeroplanes.

BULGARIA.**OFFICIAL COMMUNIQUÉS.**

Dec. 12th.—Enemy aviators displayed great activity above our positions and behind our lines.

Near Udovo, after a successful fight, Sub-Lt. von Linkel brought down a French aeroplane. The pilot, Sub-Lt. Pierre Jilot, was wounded, and the observer, Sub-Lt. Sully, was killed.

Dec. 13th.—Hostile aerial activity at Porto Lagos was without result.

Dec. 15th.—Several of our aeroplanes successfully dropped bombs on the British bivouacs and depots near Tchaizaza.

Enemy aeroplanes dropped a dozen bombs without result near Kuleli-Burgas.

SERBIA.**OFFICIAL COMMUNIQUÉS.**

Dec. 14th.—Yesterday was also marked by great aerial activity on both sides.

Dec. 16th.—Yesterday (Dec. 15th) there was artillery fire on both sides without any infantry action, and great aeronautic activity.

* * *

A report from Serbia, dated Dec. 19th, states that two British aeroplanes carried out a reconnaissance in the region of Drama. They were attacked by enemy artillery and aeroplanes, but fulfilled their mission. They brought down an enemy aeroplane.

GREECE.

A report from Salonika, dated Dec. 14th, says that German aviators have shown a little more activity lately upon this front. Within the last three days three enemy machines have been brought down at different parts of our lines. One flew over Salonika yesterday and was shelled by the fleet.

NORWAY.

It is reported from Copenhagen that since the last raid on England, when two airships were brought down, no German airship has been observed from the west coast of Norway, where formerly patrol work was regularly carried out.

[Probably because of bad weather in the North Sea, or because the Germans are saving their ships for a really big raid, to be carried out regardless of losses.—Ed.]

THE OVERSEAS AERIAL LEAGUE.

Readers of *THE AEROPLANE* will probably remember an article which appeared in the issue of March 22nd last outlining briefly the causes which led to the formation of the Overseas Aerial League, a body affiliated to the Aerial League of the British Empire and the Overseas Club.

Since the spring communications have been proceeding with the Hon. Secretaries of the Overseas Club in all the Dominions Overseas and the various Colonies and Dependencies of the Crown, as the result of which it is expected that branches of the Overseas Aerial League will be established in most of them.

The first great Dominion to take definite steps is, as might have been expected, that of Canada. Through the influence and instrumentality of Mr. George R. Lighthall, of Quebec Bank Buildings, Montreal, a branch has been formed in that important city under the patronage of His Excellency the Governor-General (the Duke of Devonshire, K.G., etc.) and the following representative committee and officials:—

PATRON: His Excellency the Governor-General (the Duke of Devonshire, K.G., etc.).

HONORARY PRESIDENTS: Baron Shaughnessy; Rt. Hon. Sir Robert L. Borden, G.C.M.G., P.C.

PRESIDENT: Sir H. S. Holt.

VICE-PRESIDENTS: Sir Charles Davidson; Hon. Senator J. P. B. Gasgrain; W. A. Black, Esq.

CHAIRMAN: George E. Drummond, Esq.

HONORARY TREASURER: A. K. Fisk, Esq., C.A.

HONORARY SECRETARY: George R. Lighthall, Esq.

HONORARY LEGAL ADVISER: W. D. Lighthall, Esq., K.C.

EXECUTIVE COMMITTEE: Brig.-Gen. A. E. Labelle, Messrs.

Wm. M. Birks, Jas. S. Brierley, James Davidson, Huntley R. Drummond, Charles Fergie, G. Foster, Thomas H. Hodgson, Lansing Lewis, J. H. Magor, A. D. MacTier, J. J. McGill, William McMaster, J. H. Sherrard, Guy Toombs, F. L. Wanklyn.

Mr. Lighthall has been a very active representative of the Overseas Club, and was able to collect from his friends and others a sum of over £12,000 for the purchase of aeroplanes for the Royal Flying Corps through the Overseas Club.

This gentleman is taking a very keen and active interest in the work of the League, and has undertaken to extend the operations of the League throughout the Dominion of Canada; in such capable hands there is every reason to expect the greatest possible success.

In addition to the importance of landing grounds, from a military point of view, no one who has followed the progress made in aviation during the last six or eight years, and especially the incalculable services which our aviators are rendering in the great war, can doubt but that, as soon as peace has been established, further immense strides will take place in the application of aviation to commercial, postal, and travelling requirements.

These points make strong appeals, not only to the imaginative, but also to the practical minds of our fellow-subjects Overseas and in the vast thinly populated areas the fact of any particular point being selected for a landing ground is accompanied with the important outlook that an industrial community will, doubtless, grow up around each for the establishment of workshops where repairs can be carried out, and of stores for aviators.

The headquarters of the Overseas Aerial League expect shortly to be able to report similar progress in Australia, New Zealand, and South Africa, and interesting correspondence is proceeding with such out-of-the-way Dependencies as North Borneo, the New Hebrides, etc.

THE R.N.A.S. COMFORTS FUND.

Further cash contributions to the Fund for the past week are: Mrs. Saunders, £1; Mrs. Snagge, £1; Mrs. Stewart Fotheringham, £1; Proceeds of Kingsnorth Drawing Office "Social," 10s.; Miss M. Gardner, 5s. These bring the total amount to £2,485 16s. 8d.

Nearly all this has been spent, as the demands from Officers Commanding the various Air Stations are very large, and further contributions should be sent at once to Mrs. Sueter, The Howe, Watlington, Oxon.

It is well to emphasise again the fact that the gifts sent by the Fund go to the men only, not to the officers, and that men on seaplane-carriers and the outlying Air Stations far from towns and from any places of amusement badly need something to help them to pass the time during the long winter evenings.

Mrs. Sueter has sent recently a number of gramophone records to various home stations, and readers who have gramophone records of which they are tired should send them to Mrs. Sueter, if they cannot send cash or other contributions. Games of all kinds, and warm garments, are particularly needed.

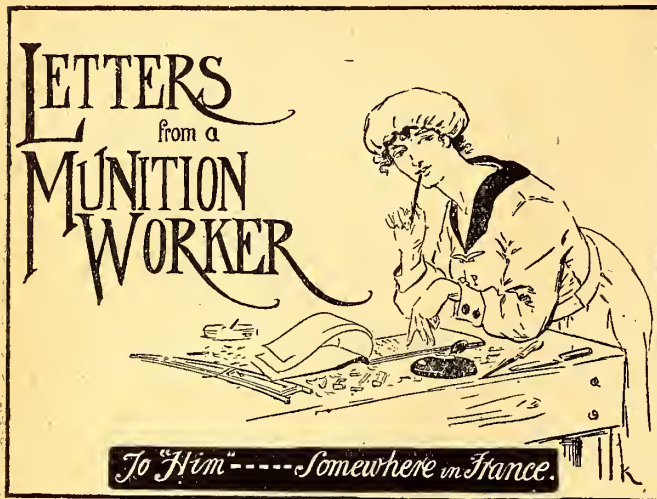
CAPTAIN BARBER'S BOOK.

"The Aeroplane Speaks," by Capt. H. Barber, R.F.C., will be published by McBride, Nast and Co., to-morrow. It will therefore be just in time for purchase by those who would like to send it as a Christmas present to their flying friends. For that purpose, one gathers from a glimpse of an early copy, it is most admirably suited. Captain Barber, master of technics though he be, has a pretty fancy, which he is as capable of using for scientific ends as Lewis Carroll was of bringing a mathematical genius to bear in the production of the most delightful of children's stories. Capt. Barber devotes the first part of his book to the Flight Folk, who in the guise of Angle, Surface, Efficiency, Drift, the Propeller and the rest, "air" their grievances and settle them happily. This strikes one as a quite delightful way of introducing principles. The second part is wholly practical, the chapters dealing with flight, stability, and control, rigging, maintenance and propellers, all illustrated with diagrams which make doubt as to the author's meaning impossible. The value of the volume is enhanced by a complete glossary and by 36 full page illustrations of types of aeroplanes reproduced from the series of Milestones which appeared in *THE AEROPLANE*. The book will be reviewed at considerable length at an early date.

THE INVASIONS OF ENGLAND.

Supplementary reports received from the police with regard to the casualties in the air raid on the night of November 27th-28th show that since November 28, when the first return of casualties was issued, two of the injured persons have died, there has been a further death from shock, and information has been obtained of a number of cases of slight injury which were treated at home and not reported. The total casualties are as follows:—

	Men.	Women.	Children.	Total.
Killed	1	3	—	4
Injured	16	14	7	37
Total				41



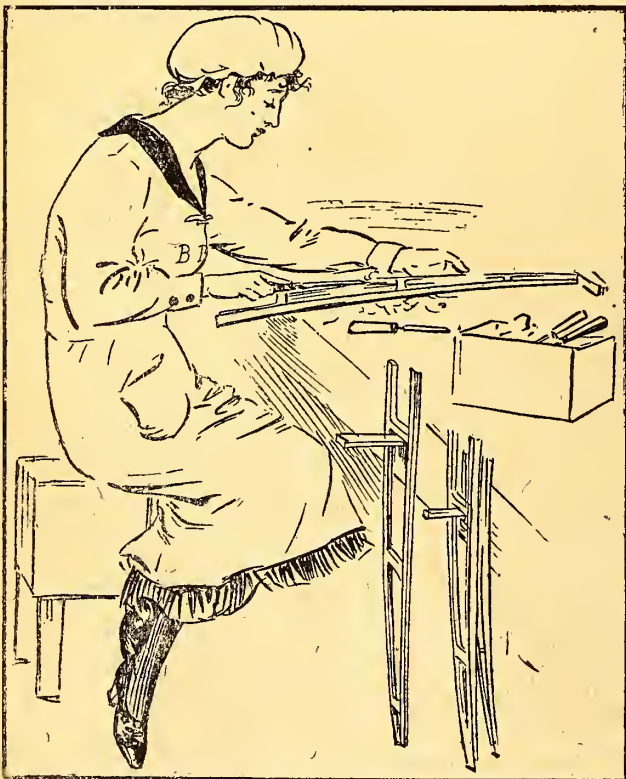
[The following interesting and amusing letter is the first of a series to be published in the "B. and P." (the works magazine of Boulton and Paul, Ltd., of Norwich), from a woman aircraft worker to her "best boy" in France. THE AEROPLANE has obtained the firm's kind permission to publish the series.—Ed.]

My Darling Jack,—Here's wishing you luck to begin with! You used to say I was "workshy." You should see me now, in my overalls, hard at it—but when I tumble out of bed in the mornings and feel inclined to grouse because the sun hasn't made his appearance, and the world seems dull and very cold and damp and generally obnoxious, I try to picture to myself how many hundred times worse it must be for you, you poor old darling, and all the other good boys with you.

Perhaps I ought to have told you that I am working at munitions; that is to say, I make a very small bit of an aeroplane—or to be quite exact, several bits of several aeroplanes, and I like the work. It's nice to feel you are doing something, and it's also nice to get the money at the end of the week.

We get paid for being punctual, that's more than you get, isn't it? If we don't lose more than three hours a week we get a war bonus, and I don't mind telling you, I am out for that bonus every time, and so far I've got it; but of course you never know your luck, as the old maid said when she hung up the mistletoe at Christmas, poor old dear!!

Lately we girls have all been very merry on the strength of



a rise—an extra penny an hour. That doesn't sound very much, but it comes to four and sixpence a week, which is over ten pounds a year, and I know lots of girls who got married on less than that in the bank.

However, there is a slight deduction to be made from that—because, whereas (as the lawyers say) the firm used to bestow breakfast upon us, free, gratis and for nothing, we now have the pleasure of paying for it ourselves, and I don't mind telling you I'm generally pretty hungry by breakfast-time.

I don't hold with the idea that a girl who's in love ought not to have an appetite. That notion is only for silly little flappers at school, who don't know the meaning of love. I'm not a girl; I'm a woman, and proud of having the opportunity of doing my little bit in the war. You know, Jack, years and years ago man lost a rib in order that Eve might be created. Well, Eve—the modern Eve—is repaying the debt now with interest. I do nothing else but make ribs for men.

Only my ribs are those that go to the making of an aeroplane, and often after I've been hard at it, I say to myself, "Good luck to it and the man who uses it" when the work leaves my hand. I like the woodwork; there's such a nice clean sort of a smell about the workshop. It seems to give me an appetite; it's either that or the sea air. I dare say you think we don't get any sea air at Norwich, but we do. It comes all the way down the river and stops just outside our doors.

That reminds me. There's a big building on the river with a notice up about "daily sailings to all parts of the world." Of course that's all "swank" just at present, but I never pass that place without thinking of you, Jack, and wondering what you'd say if I came sailing over to France from here one of these days.



Anyway, if you should see the Kaiser, don't let him know I'm thinking of coming, because he might send a boat over, to show us the way.

I know you'll find a difficulty in believing it, but we girls get through a tremendous amount of work without any 'talking.' You used to say that all women were chatterers, but you would alter your opinion if you were here. Of course occasionally—only occasionally—there are a few whispers, but as a rule we are all very stern and business-like. After all, why shouldn't we be?

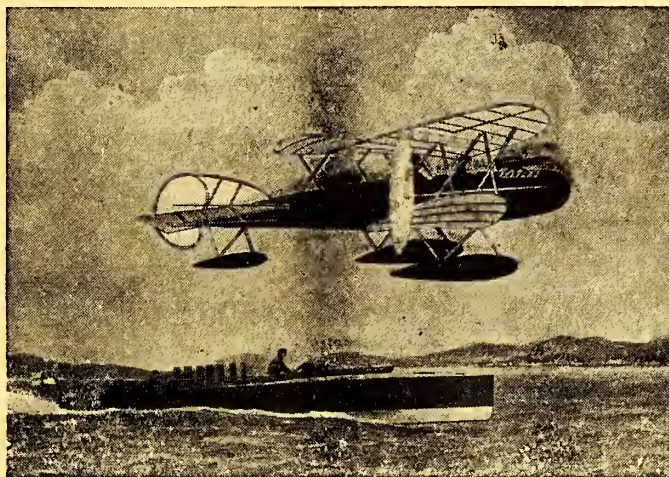
To my mind—and I'm quite serious about this—to put in bad work in return for good money is almost as bad as going to a shop and tendering a doubtful sixpence when buying a packet of hairpins. Besides, the idea of playing about when you ought to work—just because those in authority are not present—seems to me to be a little too school-girlish for these days.

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Please don't think that I'm becoming a prig and very goody-goody, but I don't think it's fair to play about when you are being well paid to work.

Of course we do occasionally let ourselves go. All work and no play makes Jack a dull boy. Isn't that so, Jack? And what's good for Jack must be good for Jill. We have a bit of a lark sometimes. The other day a girl came to work in a dream of a hat. I felt sure it would suit me, so I tried it on. She didn't mind. There were about twenty other girls all waiting to do the same thing.

While they were standing round me, staring and saying what a beauty it was (the hat, not me!) up comes She-who-must-be-obeyed. That hat was off—very much off—in about half a second, and we all melted away like snow in the spring sunshine—not that we are very much like snow.

Our overalls are a kind of yellowy drab shade with the firm's monogram in red—very toney!

When I first heard some of the girls talking about the "dope shop," I had only the haziest notion of what they were referring to. I had a kind of vague idea that "dope" was something that wicked men gave to racehorses when they didn't want them to win races. I discovered by degrees—and without giving myself away very badly—that "dope" was the stuff that is used for the painting of the wings of the aeroplane, to make them waterproof.

Well, I'm awfully glad that the dope shop is not here, but in the new works by the river, because the stuff has a most peculiar smell. I heard the other day that some wise man suddenly discovered that the stuff was poisonous, so he invented a "dope" which wouldn't hurt a fly, it was so harmless.

The only drawback to it is that the smell is just ten times worse than that of the poisonous "dope." I heard some of the workers petitioned to have the original poisonous "dope" put back again. Some people won't be taken care of, will they? They had better ask the boss for a little lavender water to put on their handkerchiefs. They say no lavender water would do it. "Some" perfume, I should think. I'm very glad there's no "dope" in the Rose Lane works. We haven't any roses, but the scent of nice new wood, newly-sawn, is just as nice when you're used to it!

I've got a lovely suggestion to make to the girls for Peace day, whenever that may be. Instead of waiting for all the men to come home, I'm going to suggest that they let all the girls fly over to France for joy-rides. No return tickets wanted for that trip. Wouldn't we have a time!

Just fancy, Jack; I suppose we could get over to you in less than an hour—seems too good to be true, doesn't it?

Well, if I write any more I shall over-sleep myself in the morning, and then away will go an hour—fourpence-halfpenny worth of my valuable time—so good-bye, darling; you know I wish you the best of luck, and that I send you all my love.

Take care of yourself, Jack, and don't forget when you have time to write that two lines are better than no letter at all.

Ever your devoted ———

HANDLEY PAGE, LTD., AT PLAY.

Of course, it is horribly immoral to indulge in luxuries and frivolities in war time; but, when one comes to think of it, all work and no play makes Jack a dull boy, and likewise it makes Jill a dull girl, so one may hold with reason that works' dinners and such jollifications are thoroughly justified. At any rate, I can vouch for the fact that much good was done by the function on Saturday last at which the firm of Handley Page, Ltd., entertained its employees at the Holborn Restaurant. When I say employees, I mean part of its employees, for nearly half of the number were held up in that pestilential fog and never arrived, but the intention was there, and those who missed the show missed a treat.

As it was, the great King's Hall was full, and if any more had arrived they would have had to feed in the Gallery—not that that would have been any hardship. Mr. Handley Page himself arrived half an hour late, owing to a gallant effort to navigate through the fog in an automobile, but his late arrival had its compensation, for coming in as he did when everyone was seated, it gave the guests an opportunity for receiving him with an ovation which must have effectually removed any lingering doubts he may have entertained as to his personal popularity with his workpeople. Men and women, girls and boys, showed vociferously their regard for their chief, as he made his stately progress to the chair of honour, hitherto ably, if not so completely, filled by his brother, Mr. Theodore Page.

For the benefit of Hunnish readers who may obtain this paper through neutral countries, I would emphasise the fact that the firm's guests—nearly all workshop hands, were fed on hors d'œuvres (sardines, and tomatoes, and things in oily sauces), soup, soup with meat in it, and thick vegetable soup, and fish with spinach and thick sauce, and mutton, and turkey, and good, white bread, and Christmas pudding, and ices, and fruits, and coffee, and assorted beverages, including excellent beer and French cham-

pagne. So that's that, for your Untersee Boats, Mr. Hun! Think of it, when you ask for a sandwich and are given a meat ticket between two bread tickets.

When all were well and fully fed, there followed an excellent entertainment, with some very short speeches in between the songs. Mr. Theodore Page proposed "His Majesty's Forces," to which Lt. D. W. Carter, R.N.V.R., replied with Service brevity. Mr. H. Whitmee, the Secretary of the show, who worked indefatigably as Master of Ceremonies, and who deserves the highest credit for his organising ability, proposed "Success to the Old Firm," to which Mr. Handley Page replied in a really eloquent speech. He pointed out that the firm's machines had already broken all World's Records for weight-lifting, and for speed and climbing ability so far as big machines were concerned. This initial success should incite everyone in the firm to redoubled efforts, he said, as if everyone would double their output of work they would bring all the nearer the happy day when the Allies' Armies would march along Unter den Linden, in Berlin, having "wiped those damned Germans off the map"—or words to that effect. Words which drew from the audience much enthusiasm.

Mr. H. Handford gracefully proposed "The Visitors," and Mr. W. H. Workman, of the White Company, U.S.A., who is so darned neutral that he doesn't care which country whacks Germany, expressed our sincere thanks for a thoroughly enjoyable entertainment.

For myself, I can say that with Mr. Page on one hand, and my old friend, Mr. Meredith, the firm's able works manager, on the other, I was bound to have an amusing evening anyway, but the musical turns were extraordinarily good, especially Miss Muriel McGregor, who has a beautiful contralto, and Miss Ruby Wilson, a clever singer of comic songs. The intelligent appreciation of their performances by the Handley Page employees was noteworthy, and one could not help being struck by the evidently high quality of the audience in general. Mr. Page and Mr. Meredith have certainly managed to secure a works staff which is distinctly above the ordinary level of factory hands, which, very probably, accounts for the unusually high quality of their workmanship.

Perhaps one may be permitted, in conclusion, to compliment the firm's feminine employees on their appearance. In something well over 20 years' experience of factories of all sorts, I cannot recollect seeing as many nice-looking and smartly turned-out girls in the employ of one firm, and I have seen many a revue chorus which would simply fade away if put up in competition with them. If they continue to take the same pride in their work as they evidently do in themselves, the success of the Handley Page aeroplanes is assured for ever.—C. G. G.

ANOTHER MUNITION FESTIVITY.

Those engaged on the production of aircraft evidently appreciate the value of cultivating a feeling of good fellowship among all concerned with the aforementioned production, and, judging from the number of social gatherings which are taking place among aircraft workers, the endeavours of employers to instil the fraternal spirit into their flock are meeting with unqualified success.

That the Wells Aviation Company of Chelsea are firm believers in this doctrine is proved by the fact that they can boast a Swimming Club, which held its "First Annual Dance and Prize Distribution"—as the invitation card has it—at the Chelsea Town Hall on Saturday last, Dec. 16th.

The gathering was presided over by Mr. R. F. Wells, the head of the firm, in the official capacity of Chairman, and he was ably supported by Mr. Doyle Jones and Mr. Walter Jones. All three gave addresses to the assembled multitude, which were commendably short, bearing in mind the nature of the function, and later acted as Judges in the Fancy Dress Competition.

The winner of the first prize in the feminine section of the Fancy Dress Competition represented shavings, and the second prize represented a Bohemian artist. The first prize in the "men's" section was carried off by a married couple dressed as the "Bing Boys," the winner of the second prize represented the "night-shift." A consolation prize, consisting of a bunch of leeks, went to one "reproduced" as Charlie Chaplin. The costumes proved to be so humorous and varied that the Selection Committee had great difficulty in awarding the prizes for the best efforts.

The good work of the swimmers during the season is shown by the following awards:—Winner of the Diving Championship, Mr. Beckwith. Winner of the Plunging Championship, Mr. Guy Davis. Winner of the Quarter-mile Championship, Mr. Guy Davis. Winner of the Inter-departmental Team Race, the Staff Team, consisting of Mr. Guy Davis (captain), Mr. Young, Mr. Blakev, and Mr. Youett. Winner of the 155 Yards Fortnightly Handicap, Mr. Johnson, with Messrs. McKinley, Burton, Cahill, and Harris, 2nd, 3rd, 4th, and 5th respectively.

The winner of the Combination Race, consisting of four lengths of the bath, breast stroke one length, back-stroke, side-overarm stroke, and trudgeon stroke—each one length—was again won by Mr. Guy Davis, with Mr. Beckwith 2nd, and Mr. Burton 3rd. The Wells' Aviation Swimming Club are to be congratulated on having such a fine swimmer as Mr. Guy Davis in their ranks.

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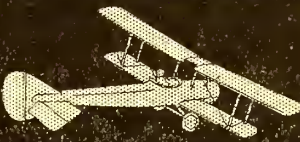
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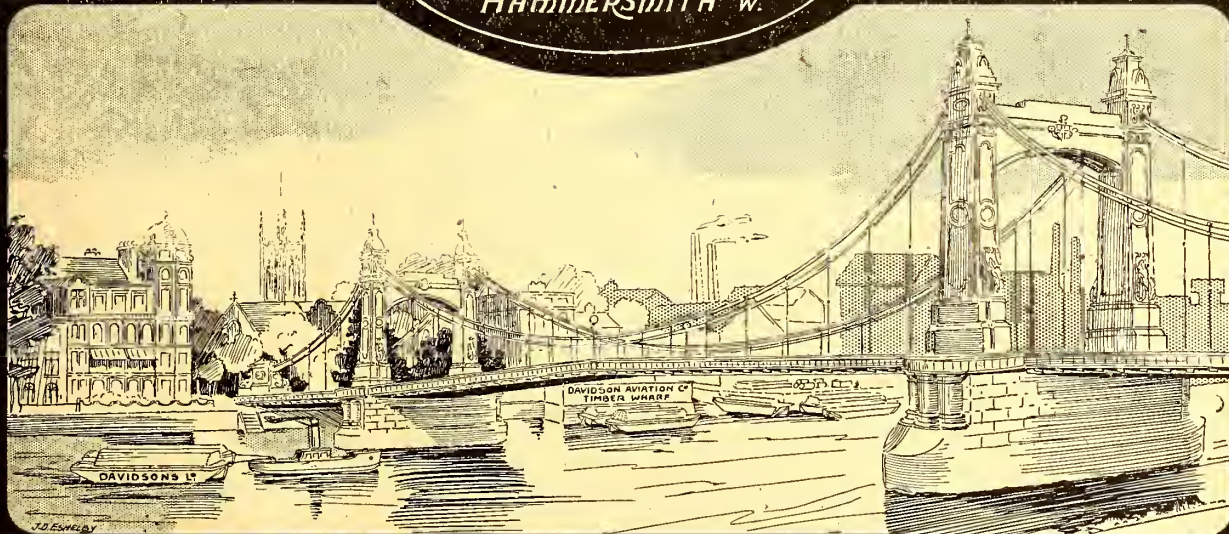
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and, as their champion, he should be well able to uphold the reputation of the club when, if ever, an Aircraft Workers' Championship Cup comes into being among the various aircraft firms.

The novices' race for learners resulted in:—1st, Mr. Hayes; 2nd, Mr. Loker.

Unfortunately, the feminine section of the club has been very poorly supported during the last half of the season, and it is to be hoped that this portion of the Wells' community will in future go in seriously for swimming, so that when the next annual presentation of prizes arrives they may have a goodly share of the spoils. As it was, the prizes offered to this section this year had to be scratched.

Taking things all round, the Swimming Club, excellently organised throughout by Mr. F. Blakey, the Hon. Secretary, and Mr. Guy Davis, has been a great success. The club numbers among its supporters Mr. Wells, together with Messrs. Doyle Jones, Peedy, Foster, Ward, Youett, and Booker, all of whom have donated prizes.

A great feature of the dance was the "Twilight Waltz," which was thoroughly appreciated by everybody, and Messrs. Blakey and Davis deserve the thanks of all concerned for having organised such a thoroughly excellent social gathering. It says much for their popularity that the dance was so well attended—no less than 300 dancers being present, in addition to about 100 visitors—bearing in mind the exceedingly opaque weather and the difficulty of travelling in the fog.—A. H. P.

OBVIOUSLY.

The following letter appeared in the "Morning Post" of December 14th.—

Sir,—Out of the abysmal ignorance of all things maritime, I ask whether the submersible merchant vessel is not the only hopeful reply that England can make, ultimately, to the menace of the submarine warship? I make this suggestion without in any way flattering myself that it is not a very obvious one; but I do not happen to have come across it, and this is a moment when a fool, who rushes in, may hope for lenient treatment at the hands of the wise.

For this war, it would seem, we can only trust to the arming of merchantmen; but there will be other wars. When these take place, if England is in a position to submerge her cargo ships, she will probably find it greatly to her advantage. The submarine warfare is only beginning. Why should not the submersible merchantman begin? Indeed, it has begun—in Germany. It may have begun in England—and I would be glad to think so. A hundred years ago our merchant fleet was wooden, with sails. To-day it is of steel, with steam. If, a hundred years hence, it is submersible, the second transformation will surely be no more remarkable than has been the first.

And suppose that it had already been made!—Yours, etc.

Hampstead, Dec. 13th.

WILLIAM CAINE.

[And, may one ask, what hope will there be for any surface merchantman when the big sea-going destroyer-aeroplane arrives? Such aircraft are already in sight.—Ed.]

MR. PEMBERTON-BILLING'S INTERESTS.

In consequence of the remaining directors having purchased the whole of Mr. Pemberton-Billing's interests in the company of Pemberton-Billing, Ltd., a special resolution has been passed, with the approval of the Board of Trade, changing the name of this company, which will in future be known and carry on business as the Supermarine Aviation Works, Ltd. The company will continue as heretofore under the present management of Mr. H. Scott-Paine, and all outstanding accounts against the firm should be transferred into the new name of the company.

FINANCIAL.

A very old-established firm of aeronautical engineers has an opening for a partner to supply a few thousands extra capital. The firm is well supplied with orders both from the Admiralty and War Office, and is willing to give every facility for investigation by a would-be investor. Inquiries should be addressed to, T.L., c/o the Editor of THE AEROPLANE.

TIMBER FOR AIRCRAFT.

Aircraft manufacturers or timber dealers who want to lay in a supply of ash for future use, or to have it kiln-dried for immediate use, will do well to note that the editor of this paper can put them in touch with further supplies. The timber is still standing, and its quality is stated to be of the highest. Anyone who is interested in such a proposition is invited to write to the Editor, 166, Piccadilly, London, W.

SPECIAL CONTRACTS WANTED.

A well-known firm of manufacturers whose productions include high-class woodwork are anxious to commence making wooden component parts for aeroplanes. Their experience makes them exceptionally qualified for carrying out ash bending operations and work of a similar class.

Aircraft constructors who are prepared to place out special contracts for this kind of work are invited to communicate with the office of THE AEROPLANE, marking the letter "B."

ANSWERS TO CORRESPONDENTS.

[Enquiries should be addressed to "The Editor," THE AEROPLANE, 166, Piccadilly, W.]

E. G. D. (Arbroath).—A number of readers have enquired whether it is intended to produce the Special Naval and Military Issues of THE AEROPLANE this year which were so popular last year. As the notice printed elsewhere states, it is intended that these shall be produced, and it is hoped that the forthcoming special issues will excel anything that has ever been done by the aeronautical Service press. No attempt will be made to compete with "Comic Cuts."

E. G. R. (Lincoln).—Youths of 18 may enlist in the R.N.A.S. and the R.F.C. Applications should be made in the first instance to the R.N.A.S. Recruiting Depot, Crystal Palace, and in the second instance to the R.F.C. Recruiting Depot, Regent Street Polytechnic, London, W., or the R.F.C. Depot, South Farnborough, Hants. Boy ratings are taken in the R.N.A.S. and are trained in wireless, etc., and boy learners are taken by the R.F.C., and also trained in wireless.

W. G. (Ayr).—Applications for cadetships in the R.F.C. should be addressed to the Department of Military Aeronautics, Adastral House, Victoria Embankment, London, E.C. Application for acceptance direct as a cadet might be better than joining a regiment and applying for a transfer, as military necessities might make it impossible for you to be spared from the regiment.

F. W. G. B. (Berks).—The acceptance of civilians as Probationary Second Lieutenants, R.F.C., has been stopped except as regards special nominations. Cadetships are now offered, and cadets who perform well may receive General List commissions, but an R.F.C. officer on the General List is presumably liable to have to resign at the end of four years, no notice to the contrary having been issued. If you wish to enter the Army as a profession, the best thing you can do would be to go to Woolwich or Sandhurst, with a view to qualifying for a commission in the Regulars. It would then be open for you to apply for a transfer to the R.F.C., and, in the event of your flying nerve failing, you would automatically be returned to your regiment.

B. M-S. (Aberdeen).—The equivalent of the R.F.C. cadet in the R.N.A.S. is the Probationary Flight Officer, and applications for appointment as such should be addressed to the Air Department, the Admiralty, S.W. Prob. Flight Officers are taught to fly at the expense of the Government, but appointments may be expedited in certain instances by learning to fly at one's own expense at a civilian school.

A. E. H. (Wednesbury).—In the ordinary course of affairs one might be doubtful whether a youngster with a Board School education could obtain a commission in the R.F.C., but in view of some of the appointments to commissioned rank, one is led to believe that education has no essential bearing on the subject. At any rate, your letter is very much better written, worded, and spelled than that of the average public school boy, so there is hope for you.

The best thing you can do is to apply to the Directorate of Military Aeronautics, Adastral House, E.C., for appointment as an R.F.C. cadet. Your only other course would be to enlist in the R.F.C., if you have served your time to any branch of mechanical work, and take your chance of winning a commission by good service.

ANXIOUS (Acocks Green).—Applications for appointment as an R.F.C. cadet should be made to the Department of Military Aeronautics, Adastral House, E.C. The training is hard and very thorough, and is wisely intended to weed out anybody who looks upon the R.F.C. as being merely an excuse for wearing a distinctive uniform. Being under 18, it would be as well for you to apply at once with a view to appointment on reaching military age; meantime it would not be a bad idea if you paid some attention to spelling, as a certain amount of fairly accurate writing is expected from officers in view of the fact that they sometimes have to write reports.

N. W. (Newport).—Novices in the R.F.C. are graded as Cadets, and receive a £10 kit allowance and nominal pay during the period of training. On appointment as Second Lieutenants they receive 12s. per day and 8s. per day flying pay. During the Cadet stage training is given in theoretical and practical flying and mechanical work, in map-reading and the elements of strategy and tactics.

C. C. S. (Malaga, Spain).—Your best course as regards learning to fly would be to apply to the Aero Club of America, Madison Avenue and 41st Street, New York, on your arrival in the U.S.A. They will probably give you all the information you require regarding aviation, and would be in a position to inform you as to which are the most reputable schools. There are several excellent American aviation papers. For instance, "Aviation," the address of which is the Gardner, Moffat Co., Inc., 120, West 32nd Street, New York. Also "Aerial Age," Foster Building, Madison Avenue, and 40th Street, New York. Subscriptions to these papers should assist you considerably.



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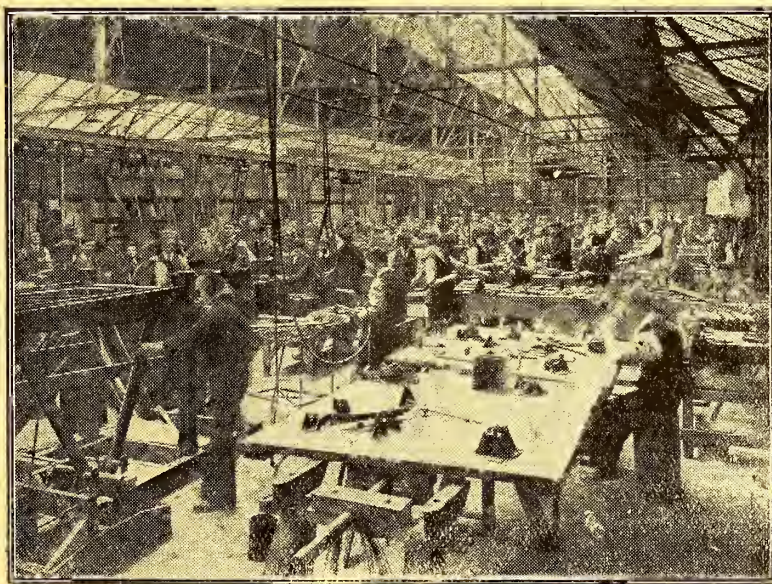
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R. H. (Leicester).—The present method of obtaining a commission in the R.F.C. is to apply for acceptance as a Cadet to the Directorate of Military Aeronautics, Adastral House, Victoria Embankment, London, E.C. It is still possible to learn to fly in the first instance at one's own expense, and though this might assist to some extent it is not now essential. After a period of probation as Cadet, satisfactory candidates are granted commissions as Second Lieutenants, R.F.C.

V. J. P. (Knighton).—Commissions in the R.N.A.S. and the R.F.C. are open to any medically fit individual of passable education. In the R.N.A.S. accepted candidates are appointed Probationary Flight Officers, without executive rank. In the R.F.C. candidates are appointed to the Cadet Corps. Application in the case of the R.N.A.S. should be made to the Air Department, the Admiralty, S.W., and in the case of the R.F.C. to the Directorate of Military Aeronautics, Adastral House, Victoria Embankment, London, E.C.

L. C. D. (Ealing) states that he has been a mechanical engineer for the past twelve years, and has been in the employ of some of the largest firms in England, and that he is now desirous of joining a society. Unfortunately he omits to say whether he means a Trade Union, such as the Amalgamated Society of Engineers, or a technical society, such as the Aeronautical Society. In the former case he should naturally apply to the local "walking delegate" who haunts his particular engineering shop, and in the latter case he should write to the Secretary of the Aeronautical Society, 11, Adam Street, Adelphi, London, W.C., and ask for particulars concerning the Society.

As yet there are no purely aircraft Trade Unions in existence, various classes of aircraft makers being apparently under the thumbs of the various Unions to which the men belonged before entering the aircraft industry. Many of these Unions have done their best to assist the output of aircraft, whereas, unfortunately, others have hampered it to a very great extent.

L. C. D., and other readers, would do well to note that the Aeronautical Society is the only institution recognised by the Flying Services, by the Aircraft Industry, and by aeronautical scientists, as representing the scientific side of aviation. It is understood that very considerable activity may be expected from the Aeronautical Society in the near future. Those interested in aeronautics will do particularly well to note that there is no connection whatever between the Aeronautical Society of Great Britain and a concern which has adopted the title of "The Aeronautical Institute of Great Britain."

W. S. R. (Darlington).—Applications for commissions in the R.F.C. are not entertained from candidates under the age of 18. It is not essential that you should join an Officers' Training Corps. Application should be made to the Department of Military Aeronautics, Adastral House, Victoria Embankment, London, E.C., for acceptance as an R.F.C. cadet, and if you emerge successfully from the probationary period in the aforementioned Cadet Corps you will ultimately be granted a commission as a Sec. Lieut., R.F.C.

Your motor-cycle experience should certainly be an advantage, and a private school education would not debar you from a commission provided that your other qualifications are up to the required standard.

H. J. W. (Goodmayes).—Your only chance of getting into the R.F.C. under the age of 18 would be to enlist as a "Boy Learner." If you desire to do so, you had better go and see the Recruiting Officer, R.F.C., either at the Regent Street Polytechnic, or at the R.F.C. Headquarters, South Farnborough, Hants. As your eyesight prevents you from becoming a pilot, it is unlikely that, if physically fit otherwise, you could obtain commissioned rank in the Corps. The only civilian school at Hendon not yet under direct Army control is the Hall School.

A ROTAX MOVE.

The Rotax Motor Co. wish it to be known that Mr. C. Benson, lately works manager of the Arrol-Johnston Co., has joined up as works manager of the Rotax Co., as from Dec. 1st. The increasing scope of the important work being undertaken by the Rotax Co. is the reason for this appointment. Mr. Benstead, until lately works manager of the Rotax Co., will devote himself entirely to the electrical side of the business.

The Rotax Co. are fortunate in being able to obtain the services of Mr. Benson, whose workshop experience is a very extensive one, for he has worked for large engineering firms both in the States and in Germany, in addition to his extensive experience in this country, including such firms as Alfred Herbert, Ltd., David Brown and Sons, and Humber, Ltd., as well as to the Arrol-Johnston Co.

POLAR EXPLORATION.

A report from New York states that Captain Roald Amundsen, the Norwegian explorer, who discovered the South Pole, and who has gone to the United States to buy concentrated foods and scientific instruments for his North Pole expedition scheduled for the summer of 1918, may make the last lap of his journey by aeroplane.

The vessel in which he will sail into the Arctic Ocean will be launched in March. He will proceed on this as far as possible, hoping to drift over the North Pole with the polar current. Should this be impossible he will try to reach it by aeroplane.

Captain Amundsen is now said to be personally supervising the construction of a machine built to his own requirements.

TO AID STANDARDISATION.

To further the proposal for standardisation the Aircraft Supplies Company, Ltd., London, are publishing a book compiled by Mr. Isaac, a director of the company, containing a complete illustrated list of standard A.G.S. parts for aircraft, which includes drawings, photographs, dimensions, material specifications, fits and limits, screw-threads and several interesting charts covering the standard adopted by the R.A.F. Copies of this, which explains the A.G.S. standard in detail, will be forwarded without charge to any manufacturer who may be interested in the subject, when published at the end of this week.

This firm also propose to publish shortly, after consultation with various aircraft constructors, full details of a number of new standard aircraft parts for use on all types of machines, so as to demonstrate in a practical manner the possibilities of standardisation.

"LA GUERRE AERIENNE."

Reference was made in THE AEROPLANE a fortnight ago to a new French aviation weekly called "La Guerre Aérienne," but the address of the publishers was omitted. This is 30, Rue de Provence, Paris, France.

The subscription is 29 francs per annum, or 15 francs for 6 months.

YANKEE HUMOUR.

(From the "Aerial Age," New York.)

American (in London): "Why, I always thought that the London hotels were fearfully expensive. I just got a suite of rooms on the top floor of the best London hotel for one pound a week."

Coster: "Suite o' rooms nuthin'. Them's the Zeppelin parlors you got!"

[An intelligent anticipation for next year? What? The idea is good, even if the dialect is of the Bowery and not of White-chapel; and why a coster, and not merely one of the hotel waiters? —Ed.]

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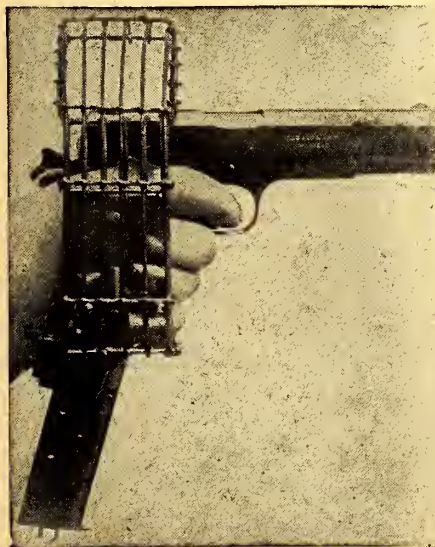
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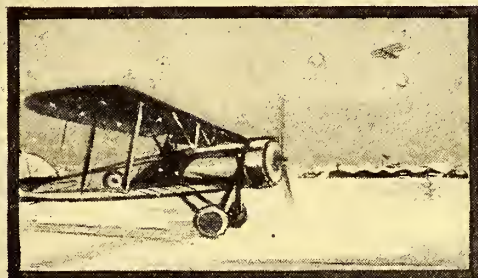
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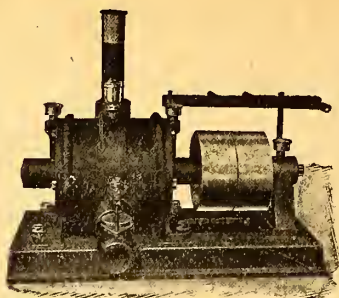
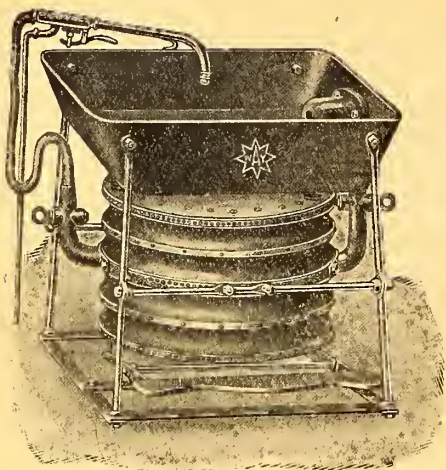


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The large amount of metal work involved in the modern aeroplane entails the use of a considerable amount of forge work, and efficient equipment in the smith's shop will do much to accelerate the general output.

Alldays and Onions Pneumatic Engineering Co., Ltd., carry a large range of smith's machinery, all of which is well adapted for the different operations it is intended to carry out. Their catalogue contains a number of patent combination brazing hearths, one of which is illustrated. This particular model was originally designed for cycle work, but it is equally suitable for aircraft brazing work. The bellows is operated by foot power. The size of the pan in the smaller model is 33 in. by 26 in. with 24 in. bellows.

A number of more elaborate hearths, some of them equipped with power blowers, are also stocked.

A useful fitting in either hangar or workshop is the adjustable engine stand illustrated. The stand is adjustable to take any engine, and will also hold a gear-box or back axle. The greatest rigidity is obtained, and engines can be run on the stand under their own power with perfect safety. The stand is provided with roller feet, so that it can be moved into any posi-

tion, and when not in use can be packed almost flat. Another engine stand, especially useful for erecting work, has a reversible table, so that the engine can be turned bodily upside-down, or even held sideways when required.

A simple positive-pressure blower and gas-compressor is illustrated which is intended to be driven by power to supply air to the gas and oil furnaces or blowpipes where a uniformly steady pressure is necessary. The steel shaft runs in gun-metal bushes, the lubricating system is efficient, and having no gear-wheels it runs absolutely silently.

In addition to the articles described, Alldays and Onions handle an enormous range of general smith's tools, including vices, vice-benches, blow-pipes, grindstones, surface plates, marking-off tables, stocks and dies, and so forth and so on.

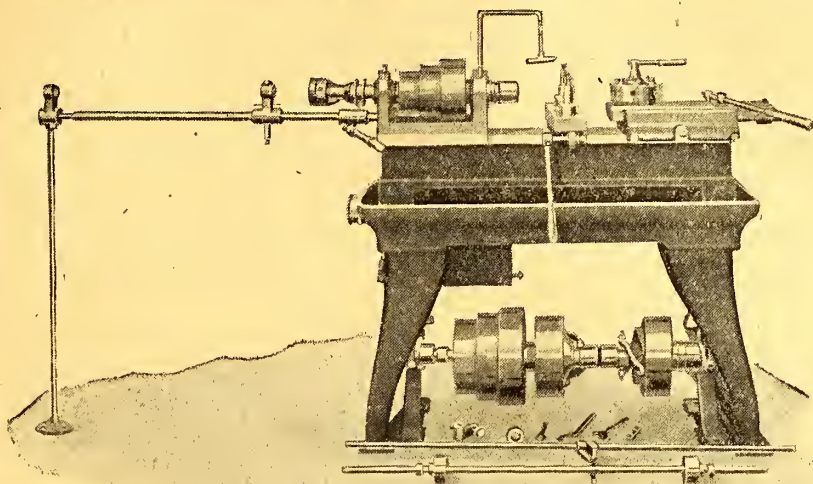
Enquiries addressed to Alldays and Onions Pneumatic Engineering Co., Ltd., Great Western Works, Birmingham, will receive prompt attention. The London depot is at 58, Holborn Viaduct, E.C.



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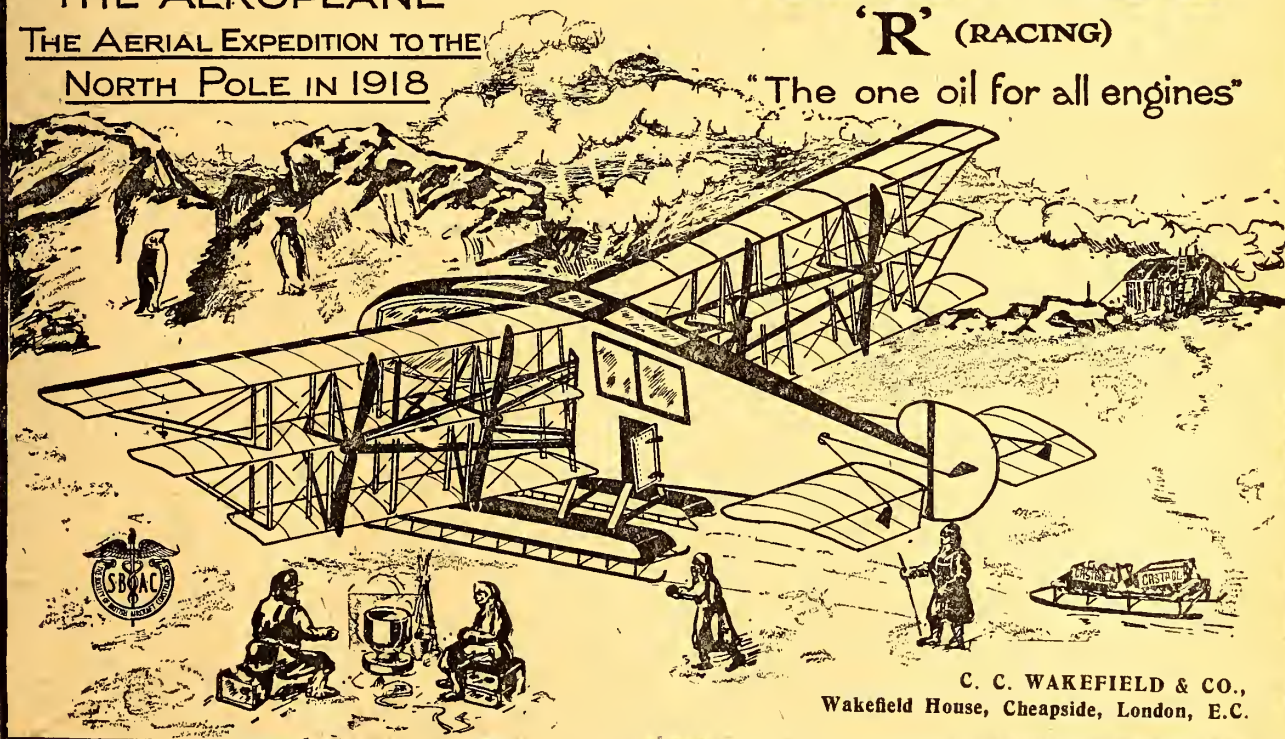
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SOME SUGGESTIONS FOR CHRISTMAS PRESENTS.

The question of buying Christmas and New Year presents for friends and relatives, both on service and at home, is always a difficult one to solve, having due regard to economy, utility, and acceptability. A gift, to be acceptable, must be appropriate; it need not be expensive; but, unless it fills some niche in the life of the recipient, it is merely inspected with a reminiscent smile, and laid aside with the Christmas cards.

A few suggestions as to useful and ornamental articles which may be purchased for this purpose are therefore made.

FOR PERSONAL COMFORT.

Robinson and Cleaver, Ltd., of 156 and 168, Regent Street, W., best known for their famous linen goods, have for some time made a speciality of Service outfitting, and cater especially for the Flying Services.

A garment which would make a very useful present for anyone who flies is a leather waistcoat, warm and windproof, the price of which is 25s. 6d. and upwards, according to size. A still warmer garment of similar shape is a leather waistcoat lined with fur.

Another garment which should appeal to the all-weather pilot is a waterproof made on the lines of what is known as a "trench coat," the material used being oilskin, which makes it absolutely impervious to water.

This coat may be adorned and rendered warmer round the neck by a detachable fur collar, which is fixed on by four or five buttons. The collar may be turned up or down as circumstances dictate, and it can also be worn with the ordinary leather flying-coat.

Chamois-leather pants and vests, both of which cost 30s., are something of a novelty. They have the advantage of being windproof as well as warm, and the management have no hesitation in giving assurance of proper ventilation, openings being made under the arms of the vests for this purpose.

The selection of black and tan helmets, face masks fitted with



Robinson and Cleaver's Oilskin Trench Coat.

Triplex glass, chin muffs, and other calory conservers is far too numerous to describe in detail. A personal visit is necessary, when the caller will receive the most courteous assistance from the staff in the selection of suitable presents. But mention must be made of a glove which combines warmth and convenience. Everyone knows the difficulty experienced when attempting to handle money or other small articles when wearing the common fingerless glove, padded out with fur or other lining material. A choice of two evils has to be made—either of fumbling with the clumsy glove, feeling like an elephant in handcuffs, or of removing the glove entirely and exposing one's prehensile extremities to the cold.

Robinson and Cleaver, Ltd., have solved the difficulty by producing a soft skin glove with compartments for the fingers and the thumb, which is covered externally with a loose fur bag or muff, fixed permanently round the wrist of the glove, but a loose fit over the fingers and thumb. A convenient opening in the palm

makes it possible to extract the fingers and thumb, enclosed in the inner glove, so that they can be used to handle objects needing the sense of touch, leaving the bag or muff attached to the back of the hand, ready to slip right over the fingers as soon as required.

FOR PERSONAL SAFETY.

It may be an obscure point in psychology which makes so many of those who are offering themselves at the altar of patriotism utterly careless of the minor risks of war and air, but such a standpoint is surely based on false premises. It seems clear that the man who sets aside his daily work to take up arms for his country is bound in duty to conserve his life and his faculties to the utmost, in order that he may contribute the greatest number of war-hours to the war, and ensure his return intact, so far as possible, to civilian employment on the arrival of peace.

There is no more important feature, in this peculiar kind of war carelessness, than the neglect to take precautions to protect the eyes. Hundreds of aviators seem to attach as little heed to the losing of their eyes as to the cutting of a finger. They gaily



Robinson and Cleaver's Muff Glove.

THE AEROPLANE SPEAKS

BY

H. BARBER, A.F.Ae.S.
(Captain R.F.C.)

CONTENTS

PROLOGUE.

PART I.—THE ELEMENTARY PRINCIPLES
AIR THEIR GRIEVANCES.

„ II.—THE PRINCIPLES, HAVING
SETTLED THEIR DIFFERENCES,
FINISH THE JOB.

„ III.—THE GREAT TEST.

„ IV.—'CROSS COUNTRY.

CHAPTER I.—FLIGHT.

„ II.—STABILITY AND CONTROL.

„ III.—RIGGING.

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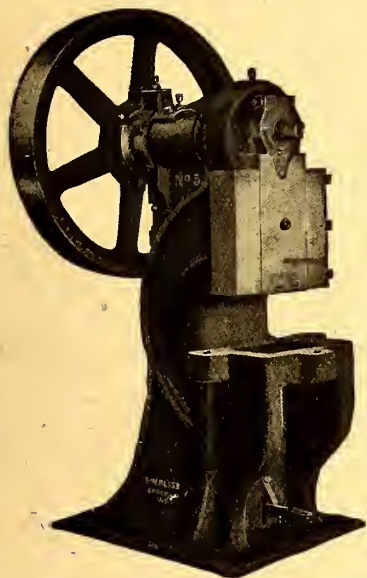
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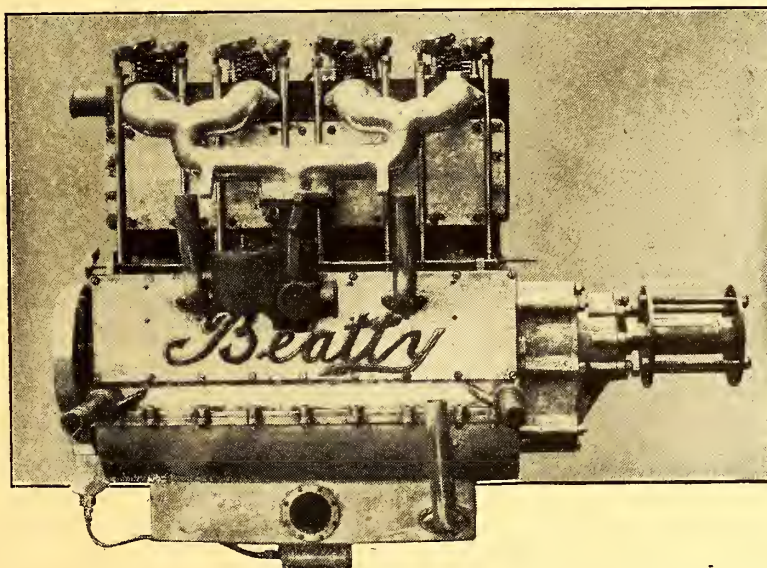
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fly high-speed scouts, which any day may fail to land right side up, wearing a pair of ordinary window-glass goggles which a tap will shatter and send a shower of splintered glass into their eyes. This danger is no mere supposition—there are several poor lads at this moment whose joy in life has been destroyed by accidents of this nature.

The reputable doctor hesitates to advocate the use of patent medicines, yet most doctors know of a few remedies, which pay stamp duty, which are prescribed by them with confidence.

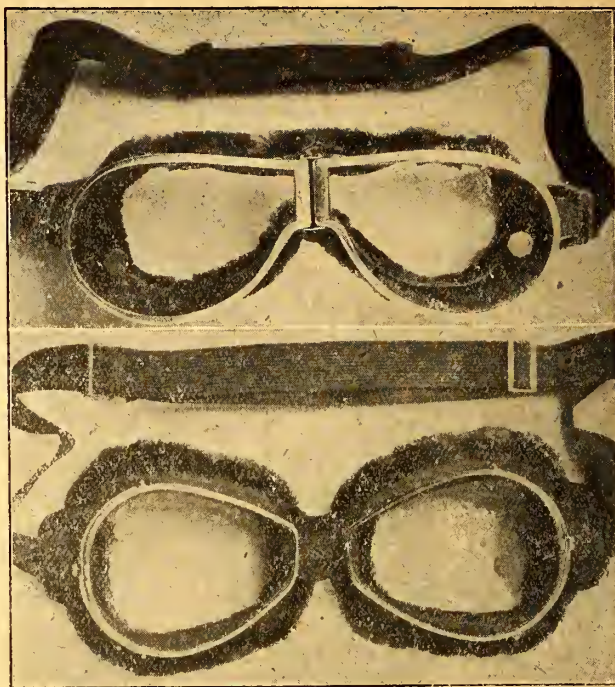
In a similar way, it is not the custom of THE AEROPLANE to employ the story of an aviator's misfortune to point a moral and adorn a proprietary article. Nevertheless, there is an exception to every rule, and in this case the exception is Triplex glass.

This article has absolutely eliminated the most dangerous property of glass, its liability to shatter into jagged pieces under concussion, and goggles made from Triplex glass can be worn with perfect confidence, as it is impossible for any blow they can receive to break them which would not in itself have fatal effects on the wearer.

The principle upon which Triplex safety glass is made is as follows: Two or more sheets of glass are interleaved with colourless, transparent xylonite sheets, to which they are firmly cemented. Three plies of glass are most commonly used. The result is that, when the glass receives a blow, it fractures, but does not become detached from the xylonite, and, as the lines of fracture in the different sheets naturally do not coincide, the whole combination retains its *status quo* and remains a complete sheet.

Friends and relations of Service aviators cannot do better than choose from the many models of Triplex goggles, two of which are illustrated here, to send as a Christmas offering. They will then have the gratification of feeling that they may in the future be responsible for the prevention of an irreparable injury.

Few Service aviators are compelled to wear spectacles when flying, but those unfortunates who do run an added risk when wearing an ordinary pair of glasses underneath their Triplex goggles, and car-drivers and motor-cyclists with impaired sight are in a similar position. It is therefore good to know that it is now possible to work Triplex glass optically, and to make a pair of goggles which act both as wind shields and spectacles, and which are quite unbreakable. A firm which makes a speciality of grinding Triplex glass to opticians' prescriptions is Melson and Wingate, Ltd., of 30, Wigmore Street, W., and persons with



Two popular styles in Triplex Safety Goggles.

defective sight who indulge in such strenuous pastimes as flying, motor-cycling, car-driving, cricket, tennis, or hockey, are strongly recommended to apply to them for smash-proof spectacles.

Information regarding Triplex glass generally can be obtained from the Triplex Safety Glass Co., Ltd., at 1, Albemarle Street, Piccadilly, W., who, by the way, are so beset with orders for glass screens ranging from $\frac{3}{32}$ inch to 3 inches thick that they are making important additions to their works.

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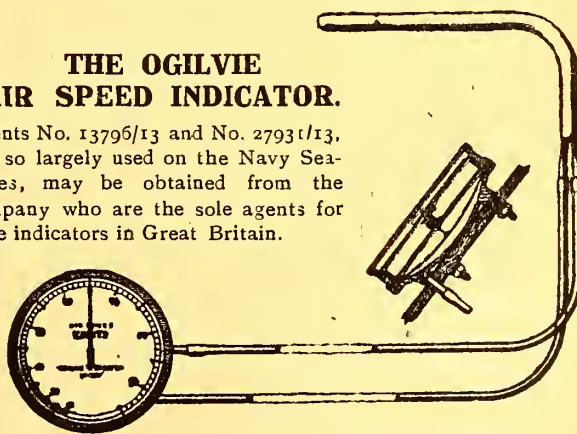


The BRITISH WRIGHT Co., Ltd.

In view of the arrangement made between the Treasury and the British Wright Co., Ltd., in respect to the free-use by the Navy and the Army of the British Wright Patents, the Directors of the Company beg to notify all British Manufacturers that machines embodying the constructions so patented, may be freely manufactured in pursuance of such Government orders. The Company is prepared to receive applications from British Manufacturers for licences to manufacture under the Wright Patents in respect to machines for private use in Great Britain or for export to Foreign Governments.

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AT DUNHILLS, LTD.

Dunhills, Ltd., of 359, Euston Road, and 2, Conduit Street, have made a speciality of supplying flying kit since ever there was anyone to whom to supply it. But, naturally, the war has made it possible to produce a far greater variety of garments than before, and experience of active service has revealed many chinks in flying gear which was supposed to be weather-proof. In designing clothing for the trying conditions under which flying has to be done, the question of hygiene must not be lost sight of,

as a wind-proof garment which is not properly ventilated is rather more of a danger than a protection, and this is a point which Dunhills, Ltd., have studied throughout.

It hardly seems necessary at the moment to describe in detail the aviation coats for which Dunhills have become famous, but several of the minor articles of clothing are well worth mention.

A very popular garment in the R.F.C. is a light-weight slip to take the place of a waistcoat, complete with sleeves and pockets. The length being almost that of an ordinary Service jacket. The material used for this is rain-proof twill lined with chamois leather, special provision being made for ventilation. The price is 3 guineas.

In flying, probably the most difficult members of the body to keep warm are the feet, and this problem has seriously been tackled by Dunhills. Their remedy for cold feet is a soft leather, black or tan, stocking, lined with sheep-skin, made to come up well over the knee. Naturally, these stockings are worn inside regulation boots of extra size. The price per pair is £4 10s., but a cheaper edition lined with fleece can be bought for 3 guineas.



Dunhills' chamois-lined slip jacket.

leather, black or tan, stocking, lined with sheep-skin, made to come up well over the knee. Naturally, these stockings are worn inside regulation boots of extra size. The price per pair is £4 10s., but a cheaper edition lined with fleece can be bought for 3 guineas.

A less expensive gift, but of equal utility and quality, would be one of Dunhills' cashmere scarves, either navy blue or khaki,



Cashmere scarf and leather-lined stocking sold by Dunhills, Ltd.

according to the Service of the recipient. These scarves are two yards long, so there is plenty of stuff to tie. The price is 12s. 6d.

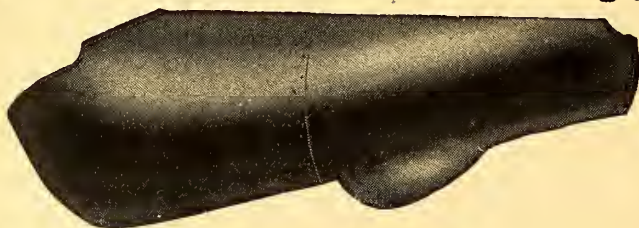
Dunhills, Ltd., carry a variety of stock of other articles, including boots and gloves of all kinds, and, in fact, everything to furnish a complete Service outfit. And quite apart from this they are noted for a large selection of motor accessories, both useful and ornamental.—W. L. W.

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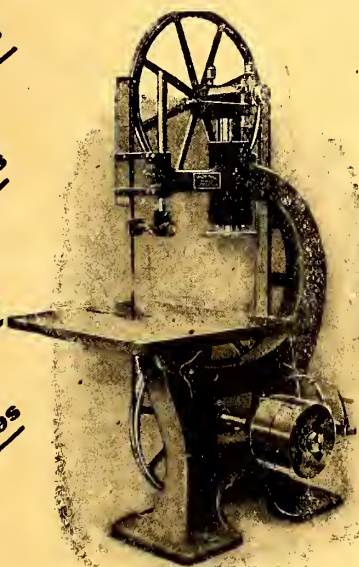
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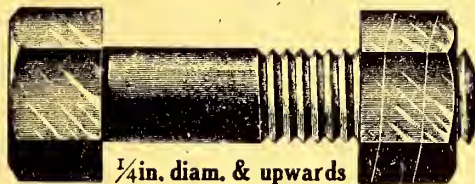


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Aero-motors: In Kind and Construction.—(Continued)

BY GEOFFREY de HOLDEN-STONE.

CONCERNING CRANK-CHAMBERS.

There is much more in crank-chamber design—and of a sort that is of particular importance for aviation—than meets the general eye. Of this I happened to have a special example brought to my notice some months ago; when, to make a long story short, a certain radial type motor, which normally has its drum-like crank-chamber liberally buttressed, was harnessed to a propeller over-sized, or over-pitched, or, in some other way, unsuitable, and so cracked in the front half of the drum, in a fashion hitherto wholly unknown. A replica of this part—a flawless casting—went the same way on the first day of use. But a simple bowl-shaped casting, inwardly ribbed, though a shade lighter, stood up to the work, and, I believe, is as sound as ever to-day.

Just so, the same curvature and internal webbing is the ideal in stationary line-types, verticles or Vs. Never was anything of the kind better than the original Panhards, which were practically Daimlers, as we all know. The one departure that can be made without lowering the stress-margin, is when the cylinders of a vertical are dropped into a deep rectangular crank-chamber half their trunk-length; a method which goes far to damp out all cylinder vibration in a long stroke motor of this type. Just as you would tie up a rose-standard or sapling, as high as possible.

Of course, anything of the kind is impossible in a V-type, which either at 60 deg. or 90 deg. must have two flat surfaces, the approach of the inner edges of which naturally depends largely on the stroke-length, in plotting out the design. But from the outer edges down, I maintain that the curvatures—as of a cylinder halved lengthwise, with its halves merely separated—should be retained and extended right down to the division flange between the upper and lower halves of the crank-chamber. And if the curvatures can be spread outwards so that this flange can be made the actual support of the motor, so much the better. It will usually be found that apart from stress advantages—and maybe some slight chance of further weight-cutting thereby—this practice alone will help to bed the motor lower down. Which, again, is an advantage—all but an essential—when the reduction-gear lifts the propeller-shaft axis several inches; it may be a few too many, above the axis of the fuselage.

On the contrary, a flat-sided crank-chamber is not good design: indeed, in my opinion, is only tolerable when the planes of the sides are parallel to the planes of the opposite row of cylinders; and well above their axes at that: more or less X fashion. If this results in a somewhat shallow side, a low bedding-down can also be obtained, as a rule, with the further useful result of a much more accessible lower half and sump, which are the parts to which access is most needed and oftenest to seek. All this does not increase the vulnerability of a part that is vulnerable anyway, and should be armoured, in any case, with some sort of detachable cuirass.

THE KNOX COMPROMISE.

A slab-sided automobilish crank-chamber is the worst of features in an aeromotor, for all these reasons. This the Knox appears to have only just escaped. Its upper half is certainly on the short side; but, then, the plane of it has been pulled in, out of line with the opposite cylinder-axis. So the fact that the Knox crank-chamber is so narrow that it will enter a bed only fifteen inches wide, with seventeen-inch bolt-centres, of which such a point is made, is really a defect, considering that the side is flat. Had it been a well-curved one, it would have been an advantage; as the crank-chamber is flanged out into long supports, continuous for its whole length. Still, as flange and side are well buttressed together—doubly so, in fact—on each side of the bed-bolts, the best is made of an otherwise indifferent part of the design: all the more so that the flange is well below the transverse middle line across the shaft-axis.

The lower half of the crank-chamber—also a one-piece alloy casting—is a box-like structure with a sump, as shown. Actually, it contains no mechanism, nor any pipe connections; as the oil-pump hangs centrally from the upper half into a cylindrical oil-screen which shrouds the said pump right to the upper half; so there is no need for anything more than an oil-level gauge-glass on one side of the lower half. Which is motor-car practice; and, in my opinion, wholly inappropriate for an aeromotor. A mechanical tell-tale—of which there are many kinds for all systems of oil-feed—well, in the pilot's view, is the essential thing.

THE STRENGTH OF THE KNOX DETAIL.

On the other hand, mechanical details, both in design and dimension, seem fully adequate. Take, for instance, the crank-shaft, a chrome-nickel steel forging—on the run of the cranks and journals—of no less than three inches in diameter, yet no heavier for that, because so liberally hollowed. Again, although it is not to be supposed for a moment that longitudinal movement ever occurs, or is not fully provided against in any average good aeromotor—special provision has been made in the case of the Knox, by making the centre-bearing four inches long—to which the block casting of the cylinder groups lends itself, of course—and making a thrust-block of it, practically, by flanging the shaft before and behind it. The front-bearing, too, is the same length; and need be no longer, as the propeller-shaft is not only carried in double self-aligning running ball-bearings, but has a double ball-thrust bearing, with a load capacity of 2,650 lbs. in either direction. However, to make assurance doubly sure, the rear-bearing has been made five inches long.

ONE DESIGN RESULT.

Again, the block-design of the cylinders automatically, so to say, prevents the crank-pins from the too common defect of excessive length, and as such, would obviously do so, even were the cylinders staggered axis to gap of their opposites. So, in the

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connecting rods, narrowed in consequence, adequate attachment is obtained by widening and thickening the big ends transversely of the crank-pins; so that an extra stout cotter-bolt on either side suffices instead of the usual pair; any tendency to twist in these narrower big-ends being prevented by a tongue-and-groove locking between the jaw faces and the caps. This practice is, of course, not wholly novel in general engineering, though rare enough in the smaller powers of motor-work. But it obviously calls for the nicest fitting and the most durable material; any shim-packing being out of the question. Also, for the most carefully studied lubrication, that is certain.

However, the foundation of the whole reciprocating system is the best part of it: for not only are the babbitt-lined bronze bearing shells carried on transverse webs of $\frac{5}{8}$ in. steel plate, but the rear-bearing, for all its length—or, perhaps, because of it—is further supported by a hanger-bar suspended from a bridge or yoke over the top of the crank-chamber end, by two stout steel bolts. This being additional to its web, should give absolute immunity from that obscure down-shake, which is the secret bane of so many of the more powerful models of V, or vertical type, after several months' wear. Easily cured, it will be said, in the ordinary way of repairs. Is it? Ask and see. Or set about the job. But why not prevent it beforehand?

INTERNALS AND VALVE-GEAR.

There is not much to be said about the pistons, which have three rings and an easy clearance. The gudgeon-pins, however secured, are at least held in the right way, fast to the connecting-rod heads. But neglecting to provide them with bronze bushings seems rather taking a liberty with the aluminium alloy of which the pistons are made, however "special." Their oscillation is of the slightest, admittedly. But the explosion shocks on the piston heads, transmitted to the lugs, are in no way lessened, and are quite enough to ovalise the naked metal. After all, there is something to be said for the apparently *démodé* steel piston!

The motive part of the valve-gear of the Knox motor, on the other hand, has one or two points of technical interest. It starts with a half-time drive to a horizontal shaft, as if the latter were to be a cam-shaft with tappet rods; but which only runs to mid-length of the motor, above the crank-shaft. At this central point, it finishes with two spiral gears cut right and left upon its end. These mesh with driven spirals likewise cut upon the lower ends of the two diagonal transmitting shafts, which are encased in tubing inserted into the cylinder head. The upper end of each of these shafts now passes through a short hollow gear-shaft, and is duly keyed thereto; this gear-shaft,

which runs in a ball race, naturally meshing up with the cam-shaft.

Quite a lot of shafting! Too much, apparently. When, it would be thought, those centre-bearing flanges could readily have been formed up as spiral gears after the later Spyker fashion. Especially when those little cap-shafts are keyed on. No doubt. But there is such an operation as timing; far more easily done from one end of the motor in the old-fashioned way, with all intermediate gearing in mesh and all shafting lying in its bearings. Quite worth the extra shunting, in an aeromotor proposition.

THE SPECIAL PROPELLER SHAFT.

Manifestly from the illustrations, the propeller-shaft is enormously thick, actually $3\frac{3}{8}$ inches. True, it is bored out to an inch less inside diameter, but it has an unusual amount of work to do. It has not only to whirl that 14-ft. propeller at a normal speed of 1,140 r.p.m., but also all the strain of starting the motor; which in one of anything like this power is usually done from the other end. So even to secure such a propeller properly and safely one needs have plenty of metal for jaws and key-flanges. As it is, this shaft is connected with the starting motor through a train of gears—the largest of which is mounted upon it—and a special roller clutch. Then, of course, it has to carry the larger of the two reducing gears in the ratio of about 16 to 11. And the propeller hub alone, apart from its eight $\frac{5}{8}$ -inch bolts, happens to weigh 23 lbs. It is drawn on to the shaft by a nut turning right-handedly, locked by a plug turning left-handedly, and clamped through both flanges finally by the aforesaid bolts.

Last of all, the propeller-shaft has some to carry of the weight of the electric motor; that is to say, the armature at least. For this motor—as will be apparent from the illustration—is of much the same generic type as has been seen on the later Sheffield Simplex cars, and has its field masses built into the large drum casting that—as we saw earlier on—forms part of the main motor mass. It is, of course, a simple affair to press a button, albeit a battery needs to be carried somewhere, as one does not get current for nothing. Thus, while it is pretty, is it aeromotor art in the present stage of development of even the largest aeroplanes?

It seems to me worth a machine-gun, or an extra man, or a few more good, hefty Hun-blasting bombs. So what is the matter with two or three multiplying gears, a free-wheel clutch, a winch-shaft, and man-power?

So much for mechanical features. As to physical systems, the two carburettors are two double Zeniths, one half of each feeding each block of cylinders. I hope they get an even mixture, such

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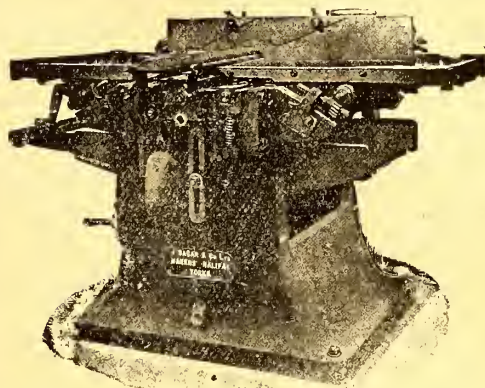
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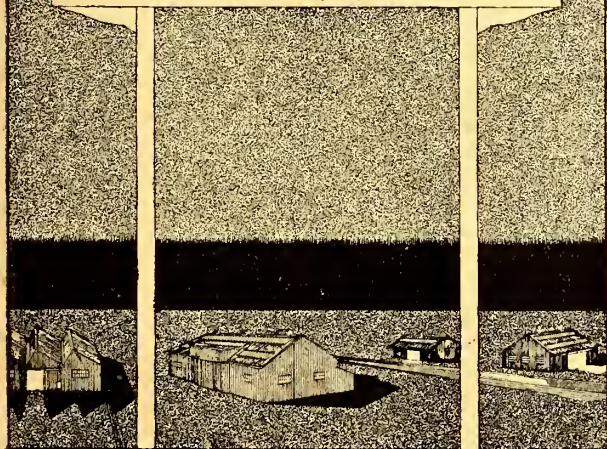
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as Zeniths usually deliver, when the aeroplanes destined to carry the Knox bank on one ear, so to say.

SOME PHYSICAL SYSTEMS.

The lubrication system, at any rate, seems to be a very positive affair. Starting as already described—and as the sectional drawing shows very clearly—with that central oil-pump, which is more part and parcel of the motor than usual, the latter's outlet registers with a large steel pipe set originally into the mould of the crank-chamber casting; from which again various leads run, all of which are lined with inserted steel tubing; the idea being to move against the sweating through of the petroleum-derived lubricant, and so secure cleanliness rather than save any negligible loss of oil. Having thus been forced into the crank-shaft, the oil leaves it again—some of it—at the rear end-bearing, passing thence into the horizontal-drive shaft, up through copper tubes at one end of it to above the cylinder heads; then through the cam-shaft brackets into the hollow cam-shafts and rocker-shafts, saturating all working parts, and finally draining down from the trays through the transmission-shaft tubes into the crank-chamber. *Und so weiter.* Effective, but a trifle extravagant, as those oil-trays are formed. A little oil goes a long way to lubricate a valve-gear. Let it stop dead at every rocker, and circulate back where it came from as it came; not drain back.

The only thing about the water circulation is that the pump is driven direct through a flexible coupling from the tail of the crank-shaft, and has the water on both sides of its turbine, thus avoiding thrust and strain. The run of it is as illustrated, two ways out and one in.

ESPECIALLY THE IGNITION.

On the other hand, the ignition is distinctly interesting as a throw-back to an earlier system, which is really much more reliable and not one-tenth of the trouble to time. Likewise, for all the argument about what may be—but is not—done, giving a wider range of advance and retard, positively on the crest of the magnetic wave all the time under any variation; and so giving a more certain spark. Incidentally, the chance of more power; and—since a second spark plug per cylinder is thus made superfluous—the certainty of less wiring and shortages. It is merely the battery and coil—in circuit from the starter outfit—with the dynamo-on-a-line to follow; the system of so many American cars and motor-boats, but only of Pipe in Europe, so far as I remember. Enough, one would have thought, to start a 12-cylinder motor on the switch, by itself without that auxiliary outfit. Especially since there is a pull-shaft on either side of the motor to operate all six priming cocks at once.

There is a tachometer on one end of one of the cam-shafts; an extension of the horizontal shaft through the gear-case cover carries a pulley. To drive a wireless outfit; likewise a valveless "two-stroke" sort of air-pump that maintains the pressure in the petrol tank; thus to complete the most highly elaborated of aeromotors, fittest for a Pullman aeroplane with sleeping accommodation, kitchen, h. and c. and lavatory as fitted.

But for a soldier's or sailor's use I prefer art. It's simpler.

(To be continued.)

THE "B.P." WORKS MAGAZINE.

The December issue of the "B.P." Works Magazine beats the record as regards pages, and certainly as regards the quality and interest of the matter. An excellent portrait appears of Mr. G. M. Chamberlin, the Right Hon. the Lord Mayor of Norwich. An interesting letter from a fair munition worker to "Him," somewhere in France, describes women's work in an aeroplane factory, which winds up with the excellent suggestion that all the munition girls should be taken for joy-rides in the new aeroplanes across to France. The monthly silhouette cartoon represents Mr. G. C. Clayton, shop superintendent at Aircraft Works. A humorous drawing is provided by Mr. Alan Hill Reid. Mr. E. A. Astoff provides an excellent ghost story, which is illustrated by a regular old-time woodcut, which is followed by the words and music of a Christmas carol, apparently with the object of exorcising the ghosts! One signing himself "Nemo" discourses on gastronomy for the benefit of those who eat.

Mention must again be made of the Competition Section organised by Mr. G. C. Clayton. This is undoubtedly one of the best features of the whole magazine, and could most usefully be imitated by other firms who possess a house magazine. A demand for the design of an apparatus for testing propellers has resulted in some extremely ingenious solutions, which should be of actual practical value if adapted for use in a works. Problems set for next month are as follows:—"Required, a simple and inexpensive method of constructing a petrol tank so that, when it is pierced by a bullet, all its contents are not necessarily lost." "Required, a method of manufacturing wiring plates in large quantities, as sketch" [not reproduced here]. The idea is to arrange a method which entails the fewest operations.

It is impossible to refer in a short space to the many other items of this month's magazine, which records the football, rifle, rambling, and musical activities of the firm. It is enough to say that the production is one of the best things of its kind.

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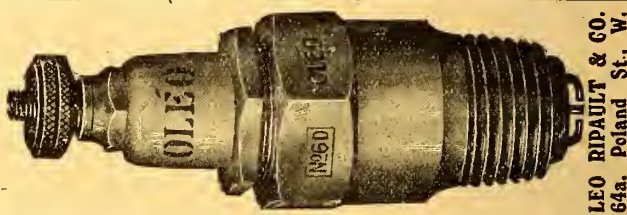
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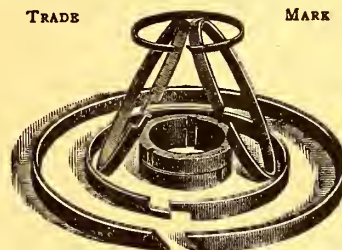
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ON THE JUDICIAL ENQUIRY INTO THE R.F.C.

The Judicial Committee which was appointed to investigate charges against, or criticisms of, the administration of the R.F.C. is to be congratulated on having produced a report which must be an acceptable Christmas present both to the High Command of the Flying Corps and to its critics. The report combines, with the highest legal skill, an exoneration of those blamed and a justification of those who blamed them. It is also a fine example of the art of at once damning with faint praise and praising with faint damns.

Perhaps a trifle too much emphasis is laid on the blamelessness of that distinguished officer, Lieutenant-General Sir David Henderson. None of the critics of the R.F.C. administration blamed General Henderson personally, their criticism being directed rather against those who had advised him wrongly, for we all recognised that no one individual can be omniscient, and any man in high authority must rely to a great extent on his subordinates and his technical "experts." The extreme trouble taken to show that General Henderson was not to blame is rather apt to convey the idea that, if *qui s'excuse s'accuse*, they who excuse someone else overmuch feel that there was, at any rate, some excuse for accusation.

The thanks of the R.F.C. of the Aircraft Industry, and of all who have the progress of British aviation at heart, are due to the members of the Committee for their efforts to produce a perfectly impartial report under distinctly difficult conditions, especially as regards the obtaining of reliable evidence, in view of the conflicting influences at work.

Following the report of the whole Committee are certain memoranda by Mr. Charles Bright and by Mr. J. G. Butcher conjointly, and certain recommendations by Mr. Bright, which are of such importance that they deserve to be discussed separately. This will be done in a subsequent issue of this paper.

The briefest possible comments are interpolated, in brackets, in the body of the report, which follows hereafter.

C. G. G.

FINAL REPORT OF THE COMMITTEE ON THE ADMINISTRATION AND COMMAND OF THE ROYAL FLYING CORPS, &c.

Sir,—1. We, the undersigned, being the Committee appointed "to inquire into and report upon the administration and command of the Royal Flying Corps with particular reference to the charges made both in Parliament and elsewhere against the officials and officers responsible for that administration and command and to make any recommendations in relation thereto," beg to present our Final Report.

2. In our Interim Report, dated August 3rd last, we dealt exclusively with the charge of criminal negligence made by Mr. Pemberton-Billing, M.P. We do not refer to that charge again.

3. We sat to take evidence on 22 days, hearing 54 witnesses, between May 18th and August 1st, 1916. Whilst all the charges that have been made in public have been dealt with in public, a material proportion of the evidence has, for obvious reasons, been taken *in camera*. We have personally visited several aerodromes, and inspected a number of machines and watched their flight. During our inquiry a large number of charges or criticisms have been brought to our attention; some of a serious, some of a

trivial character. We investigated them all, but we propose, in this Report, to confine ourselves to those charges and criticisms which seem to us of sufficient importance to be worth recording.

4. Many of the charges and criticisms made before us have been based upon hearsay evidence. What we have done in every such case is to treat the statements made to us not as evidence of fact, but as indications of the directions in which our inquiries should be prosecuted with the view of obtaining all the reliable information procurable.

5. We have been greatly assisted in such inquiries by the frankness with which the various officers of the Royal Flying Corps have given us their evidence, and by their readiness, and especially that of Lieutenant-General Sir David Henderson, K.C.B., D.S.O., Director-General of Military Aeronautics and in command of the Royal Flying Corps, to give us full access to all documents, confidential or otherwise, and to give us every opportunity of personal inspection of such aerodromes, machines, and engines as we desired to see.

6. A greater difficulty has been the reluctance of junior officers of the Royal Flying Corps to appear before us, a reluctance with which we sympathised, and which was overcome in a few instances, by the arrangements we made to take this evidence in such a way as to ensure non-disclosure of the identity of the witnesses.

7. A similar reluctance was expressed on behalf of aeroplane and engine builders. Of these, only three or four appeared, although we repeatedly expressed our desire to hear any Trade witnesses who had any serious complaint to make. None of the Trade witnesses who came made any complaint, and two of them went out of their way to express their thanks for the assistance that had been given them in their work by the officials of the War Office.

[If the invitations had been personal instead of a mere general open invitation much more might have been learned. No one wanted to raise trouble for himself after previous experiences.]

8. Further, certain criticisms of the administration and command of the Royal Flying Corps were made by witnesses anxious for the well-being and improvement of the Service, upon the mistaken assumption that matters to which they directed attention had been overlooked, because the critics were not themselves aware of the activities of the Royal Flying Corps in those directions. This was inevitable in a Service where much must be done as secretly as possible, especially in war-time.

[One may perhaps suggest that many of the improvements discovered by the Committee to be in progress were made because of criticisms which took place long before the general agitation arose which produced the Committee, and that the Committee may have confused past criticism with current criticism when all was put before them. For instance, much of the criticism of the R.A.F. was years old, though it may have seemed new to the Committee.]

9. A good many complaints which had been made in public about the Air Service proved, on inquiry, to concern the naval and not the military Service.

10. In order to keep our report within tolerable compass we have written memoranda on several subjects involving detail, and we append those memoranda* to this report. We have been the more disposed to take this course, as we feel that a good deal of the information in those memoranda cannot well be made public at the present time. We trust that the body of the report, although less detailed, will be intelligible, apart from the appendices.

11. Before we proceed to deal with the various charges and criticisms submitted to us, it seems desirable to give a general outline of the Royal Flying Corps itself. We set out a more detailed description in our memorandum on the subject in Appendix A.

12. It is sufficient here to say that the Royal Flying Corps consisted of (a) the superior officers, (b) the pilots who fly the machines, (c) the observers, and (d) the mechanics who look after the machines.

* Not printed.

13. The Royal Flying Corps is divided into flights, squadrons, wings and brigades. The squadron is the unit. . . .

Pilots are practically all officers. Observers are mostly, but not entirely, drawn from the officer ranks of the Army. Wing Commanders rank as Lieutenant-Colonels.

14. Major-General H. M. Trenchard, C.B., D.S.O., is in command of the Royal Flying Corps in France with . . . General Henderson is in supreme command.

15. The Royal Flying Corps has multiplied more than twenty-fold since the beginning of the war, and its growth continues. There is, and always has been since the war, a waiting list of pilot candidates. The difficulty in training them has been want of instructors and of school machines. The former is rapidly disappearing; the latter, to some extent, still remains.

16. Perhaps the most noteworthy feature of the Royal Flying Corps system is that now every pilot must be an officer. Either he is an officer before he joins, or he is drawn from the class of civilians from which Army officers mostly come and becomes an officer on joining. Much importance is attached to this fact by the heads of the Royal Flying Corps, who attribute the skill and initiative of the pilots largely to it.

[This is a subject worth discussing at length at some later date.]

17. In considering charges against the administration of the Royal Flying Corps it is essential to know its strength at the outbreak of war. It is not necessary to repeat here all the figures, but we call special attention to the fact that its equipment in aeroplanes and engines consisted then of 179 machines. Of these, 66 were sent abroad with the Expeditionary Force, and of the remainder only about 20 were in serviceable condition. Thus equipped, the Royal Flying Corps started to serve the Army abroad and to train pilots at home.

[It is a pity that no indication is given as to how many of these were of a type fit for use in war against existing German machines and engines.]

18. In Appendix B.* will be found a table showing the number of pilots under instruction on May 1st, 1916, the number of instructors, and the training schools. It is a specimen of a daily return, and shows how the problem of training pilots is being grappled with.

19. When the development of the British Army is considered—together with its demands for pilots, observers and machines in ever increasing quantities and on many fronts—it is possible to form some notion of the demands made upon the responsible heads of the Royal Flying Corps, and some idea of the work they were called upon to perform, and that, too, under the stress and strain of war.

20. Many of the charges, and, perhaps, the weightiest, were made in respect of the equipment of the Royal Flying Corps, and, in order to understand the bearing of those charges upon its

administration and command, it is necessary to look a little into its history. We need not go further back than an Army Order dated August 28th, 1913. By this order a Military Aeronautics Directorate was constituted with General Henderson as Director-General. This Directorate was charged with the equipment of the Royal Flying Corps. In this capacity, General Henderson has charge of the Royal Aircraft Factory at Farnborough (hereinafter referred to as the R.A.F.) The immediate control of the Equipment Branch of the Service is in the hands of Brigadier-General D. S. McInnes, R.E., D.S.O., who, subject to General Henderson, has charge of the R.A.F. at Farnborough, as well as the Inspection Department and the Contracts Branch. There is no connection between the Inspection Department and the R.A.F., except that both form parts of the Equipment Branch, and are under the same control:—

21. There is thus one responsible head for:—

- (a) The efficiency of the Royal Flying Corps as an aerial fighting force,
- (b) Its equipment, and in this connection,
- (c) The Royal Aircraft Factory, whose functions were described by Lord Curzon in the House of Lords on August 1st, 1916, as being—
 - (1) Trial and experiment.
 - (2) Research.
 - (3) Preparation of drawings.
 - (4) Repairs.
 - (5) Manufacture of spares.

This description is sufficient for our purpose and we adopt it.

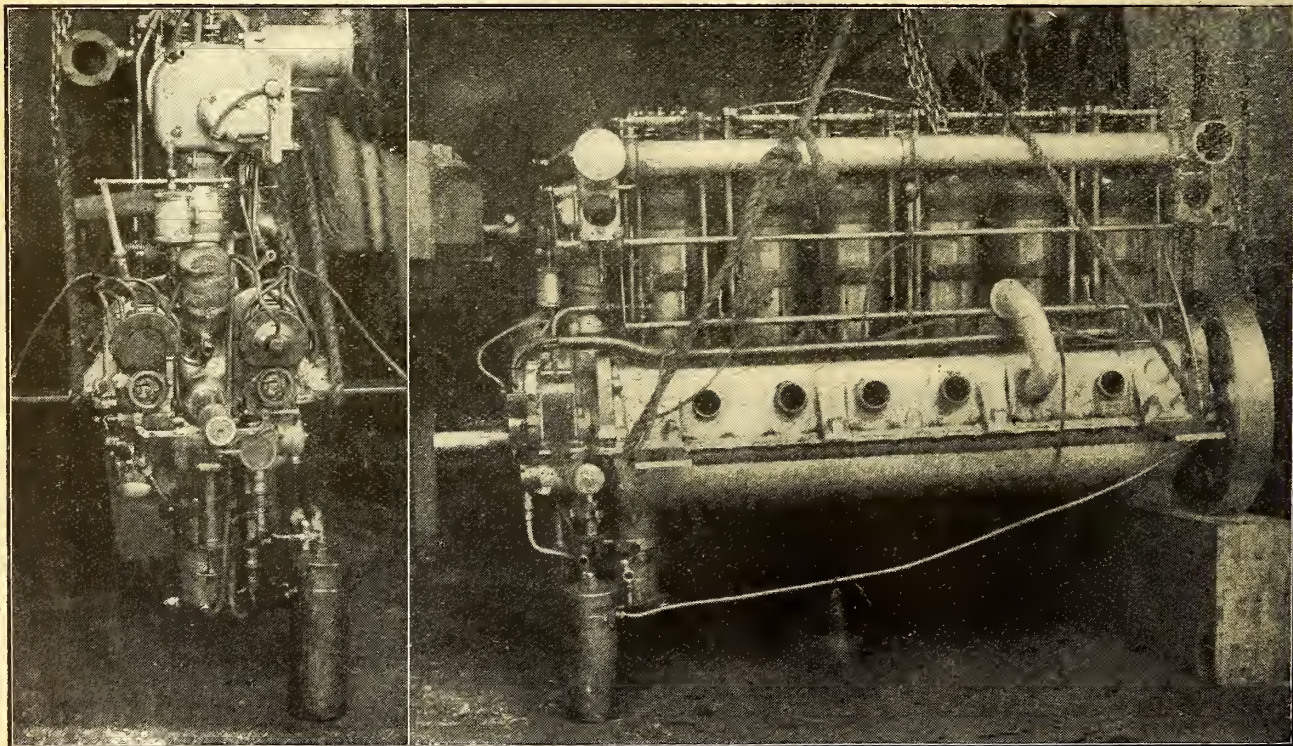
(d) The Inspection Department.

22. The Royal Aircraft Factory has been the subject of much criticism before us, and we shall have constantly to refer to it; but it must be understood that we are only concerned with it in so far as its operations have affected the efficiency of the Royal Flying Corps. With its internal administration, its economical or uneconomical working, its business organisation, we have no concern. These matters have been the subject of another and independent inquiry. The relevance of our reference to the Inspection Department will appear when we come to deal with the question of selection of aeroplanes and engines.

[It will be recalled that a Committee composed of the late Sir R. H. Donaldson, Sir Charles Parsons, and Sir Richard Burbidge, condemned the internal administration of the R.A.F., and that as the result a new Superintendent, Mr. Henry Fowler, an experienced engineer, was appointed in place of temp. Lieut.-Col. Mervyn O'Gorman, C.B.]

23. We have confined our investigations, as far as possible, to the period of the war. The condition of the Royal Flying Corps at the beginning of the war was the result of a policy for which the heads of the Royal Flying Corps are not responsible, but there are two earlier matters to which it is necessary to

* Not printed.



(Admiralty Photograph, published by courtesy of the Air Department.)

THE MAYBACH ENGINE as used on Zeppelin airships, showing end view, with magneto mountings, and inlet side, with crank-case ventilators.

refer. One is the difficulty experienced before the war in obtaining money for the development and equipment of the Service, a difficulty which has disappeared since the war. The other is the decision not to build large non-rigid airships, and the transfer of the few small airships we had to the Navy, against General Henderson's wishes, in January, 1914. Large airships demand high-powered engines. The Germans have had the advantage of working down from their big engines to the smaller ones required for their various types of aeroplanes, while we have had to work upwards from the smaller to the larger engines, a position which has proved to be distinctly disadvantageous.

[One seems to remember that Colonel J. B. Seely, when at the War Office, specifically stated in public that there was no lack of money for aviation, and that General Henderson, who was present when the statement was made, agreed with him inferentially, if not in so many words. One would further point out that the German aeroplane engines have been developed upwards from small car engines, and are of a type essentially different from their airship engines, also developed from car engines.]

24. In reading this Report, two things must be kept in mind. First, we have not inquired into the Naval Branch of the Air Service, and only mention it incidentally now and again. The Naval Air Service is not included in the terms of the reference to us.

Second, all the witnesses agree that there has been a great improvement in the efficiency of the Royal Flying Corps during recent months. The witnesses who attribute the change to their own intervention and agitation are perhaps the most emphatic and speak of the change as marvellous. We think the adjective not undeserved, although, with all deference to the witnesses referred to, the improvement is, in our opinion, the fruit of the unremitting labour of the Directorate of Military Aeronautics ever since the war began, rather than the result of a spasmodic effort due to agitation.

[Which is as may be. Certain critics could probably enlighten the Committee considerably as to the history of some improvements of which they have only learned from official sources.]

25. The charges against the administration, and command brought to our attention may be divided into two classes, general

and specific or incidental. Of these, the general charges are the more serious, and we take them first.

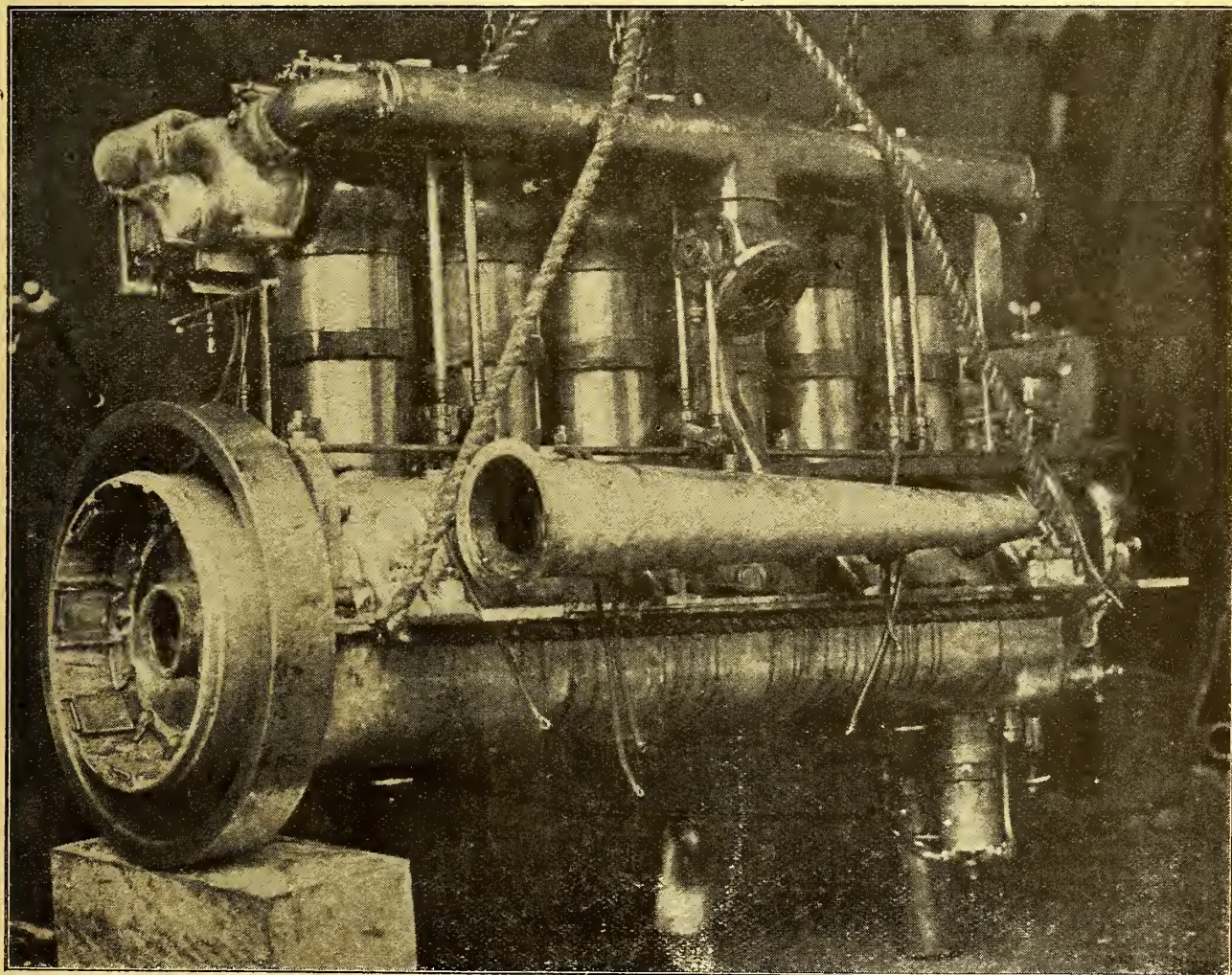
GENERAL CHARGES.

26. The general charges are:—

- (1) Want of foresight in failing to make provision for the types of aeroplanes and engines which has proved to be necessary.
 - (2) "Too blind faith in the R.A.F."
 - (3) A number of charges against the R.A.F., the most important being that:—
 - (a) The R.A.F. has acquired an ascendancy over the minds of those responsible for the administration of the Royal Flying Corps.
 - (b) The R.A.F., in the matter of aeroplanes and engines, is the competitor with private firms and the judge of their productions.
 - (c) The R.A.F. has been a dis-service and not a service to the Royal Flying Corps, in that it has failed to design satisfactory types of aeroplanes or engines, and has discouraged their design and production by private firms.
 - (d) The R.A.F. has copied designs of private manufacturers for its own use.
 - (4) The insufficient training of our pilots and observers.
 - (5) The provision for Home Defence has been muddled and inadequate.
 - (6) Loss of mastery in the air.
 - (7) Various defects in aerodromes and in the system of lighting landing grounds.
 - (8) The inadequate arming of aeroplanes.
- It will be observed that charges Nos. 2 and 3 (a) are the same charges approached from opposite points of view, and we deal with them both under charge No. 2.
- Charges 1 and 2 to some extent overlap and run into each other, but we have tried to keep them as distinct as possible.
- Subject to these observations, we now proceed to consider the general charges in the above order.

Charge No. 1. Want of Foresight.

27. This charge of want of foresight is based, firstly, upon the unpreparedness of the Royal Flying Corps for the war, a condition for which it would be unfair to hold the heads of the Roy



(Admiralty Photograph published by the courtesy of Air Department)

THE MAYBACH AIRSHIP ENGINE, 150 mm. bore, 190 mm. stroke, 240 h.p. at 1,400 revs. per min. Exhaust side, showing also outlet of crank-case ventilator, and friction-insets in the clutch-drum for internally expanding clutch. The engine is a development of the racing-car engine which won the Grand Prix of 1914.

Flying Corps responsible. The unpreparedness is undeniable, but it was the result of a policy which was imposed upon them and not determined by them. Nor would any policy which could conceivably have been adopted with the approval of Parliament or the country have provided an Air Service adequate to the needs of such a war as we are engaged in. Secondly, the charge is based upon want of imagination in foreseeing and providing for the number and types of aeroplanes and engines which now prove to be required. Aeroplanes have to be built to suit the available engines, and not engines to suit aeroplanes.

[But engines should be built to suit aeroplanes which will obviously be produced in the near future, else why build big engines at all? And surely the Administration had enough warnings.]

It has been found that, for other purposes than fighting, high-powered engines and big aeroplanes are wanted. For long reconnaissance work, for weight-carrying, such as wireless gear, bombs and the like, for artillery observation, and especially for mounting a gun for attacking dirigibles, big aeroplanes and engines are required. In the early stages of the war it seemed that they might be required for fighting purposes also, but the view now held is that for fighting purposes what is wanted is a small, easily manoeuvred, fast machine. The charge of want of foresight practically comes to this: failure to anticipate the necessity for high-powered engines and to provide for their production. Closely connected with this charge is that of failure to order in due time certain types of engines which, although not exactly high-powered engines, were yet superior to any the Royal Flying Corps had. We deal with this charge under the next head—that of too blind faith in the R.A.F.

28. The position at the outbreak of war was that the engines available did not exceed 80 h.p. Soon afterwards there was the Canton-Unné (Salmson) of 140 h.p. All these have since been discarded. The Royal Flying Corps also got within the first few months the 90 h.p. R.A.F. and the 120 h.p. Beardmore—the 90 h.p. R.A.F. in by far the largest numbers. Later the Royal Flying Corps obtained the 100 h.p. Monosoupape and 110 h.p. Le Rhone, the latter in small quantities. Later still the 110 h.p. Clerget, but substantially the highest horse-power engine which the Royal Flying Corps had in quantity for many months was the 90 h.p. R.A.F. Quite recently it has had the 140 h.p. R.A.F., the 160 h.p. Beardmore (originally known as Austro-Daimler, and now sometimes as the Austro-Daimler-Beardmore), and the 250 h.p. Rolls-Royce. So far only a few of these higher-powered engines have been delivered; but the output is increasing, and there are now other high-powered engines in sight. The Royal Flying Corps has, in effect, been carrying on with engines the bulk of which did not exceed 90 h.p. together with a few very efficient 100 to 120 h.p. engines.

[The Committee might have added after "did not exceed 90 h.p.," the words "and were unreliable at that." The Committee's information is obviously at fault. The 200 h.p. Canton-Unné (Salmson) was actually flown at Monaco in April, 1913, by Moineau on a Bréguet, and performed magnificently. An Administration with foresight would have encouraged that engine. The Committee also appears ignorant of the fact that an offer was made to build Gnome Engines in England in 1913, if an order for 50 engines was promised, and that such an order was refused, and the engines were bought in France. If the offer had been accepted we should have had the 9-cylinder 100 h.p. Gnome and the 100 h.p. Monosoupape being built in England before the war. Furthermore, the best use was not made of such engines as we had.]

29. The state of affairs thus disclosed was obviously unsatisfactory until recently, especially in view of the fact that the Germans have had from the first engines of considerably higher power, notably the Mercedes.

[Owing to the superior foresight of the Administration of the German Aviation Service, as pointed out in this paper years before the war.]

30. In order to understand the position we must go back to the spring of 1914. There was then held a naval and military engine competition for engines of from 50 h.p. to 200 h.p., with a prize of £5,000 for the best engine. There were 67 engines. Of these 23 were of engines from 125 h.p. to 200 h.p. There was only one of the latter. Only nine engines came through the test. The prize was won by the 100 h.p. water-cooled Green Engine. The highest-powered engine to come through was one of 120 h.p.

31. The R.A.F. before the war was designing a 200 h.p. water-cooled engine, and had proceeded some way with the drawings by August 1914. General Henderson, who was one of the judges at the engine competition, was of the opinion that high-powered engines would be required. He hoped, having regard to the entries for the competition, and the high standing of some of the competitors, that private firms would proceed to develop and perfect high-powered engines, and he stopped the R.A.F. designs and handed the drawings over to the Rolls-Royce Company and Messrs. Napier. The former declined to proceed on the R.A.F. lines, but designed independently the 250 h.p. Rolls-Royce engine, which is just beginning to be delivered. The Napier Company proceeded with the R.A.F. designs in collaboration with the R.A.F., and their joint efforts have produced a 200 h.p. engine, which is now being tested. There has been some delay in pro-

curing deliveries of the Rolls-Royce engine. No blame can be attributed to General Henderson in that regard. The somewhat longer delay in producing the R.A.F.-Napier engine is probably due to joint collaboration.

[If, as is stated, General Henderson was personally responsible for this move, one cannot help blaming him for relying on the R.A.F. design after all the warnings he had had against the R.A.F. theorists, and one is still more puzzled to account for his handing the joint task over to a firm which had never built an aero-engine, and had ceased even to build racing-car engines some years before. The Rolls-Royce refusal to be hampered by R.A.F. interference should have been a further warning to him.]

32. The desire of the Royal Flying Corps for high-powered engines was well known even before the war, and was the subject of discussion between General Henderson and some of the best known engine builders, a few of whom have attempted to design and build such engines, but hitherto without practical result in the matter of aeroplanes. Some promise well, and in one or two cases where deliveries have been made of high-powered engines attempts have been made to design aeroplanes for them, but, so far, without success.

33. General Henderson stated to the Committee that he made a serious mistake in stopping the R.A.F. from proceeding with their 200 h.p. engine design. We do not agree with him. We see no reason to suppose that the opposite course would have resulted in the earlier production of high-powered engines.

34. It is to be regretted that General Henderson's anticipation of getting high-powered engines from private firms, who knew that they were wanted, was not earlier realised, but that is not due to any fault of his.

[Well, if not, it was certainly not the fault of the firms, for one could scarcely expect engine-makers to embark on expensive designs when no orders were promised, when official favour obviously tended towards the R.A.F., and when French engines were being bought as stop-gaps till the R.A.F. engine was fit to use.]

35. We think this charge of want of foresight is unfounded.

Charge No. 2.—"Too Blind Faith in the R.A.F."

36. The point is put as an argument thus: General Henderson, as Director-General of Military Aeronautics, is responsible for the R.A.F. It is to his credit if it does well, to his discredit if it does ill. It is only natural, therefore, that he should prefer the designs of the R.A.F., whether for aeroplanes or engines, to those of private manufacturers, and that he should give the R.A.F. facilities for designing aeroplanes by letting them have the best engines round which to design their aeroplanes, and refuse the same facilities to private firms.

The facts, say the critics, are in accordance with and support the argument, and they rely upon the following:—

There was delay in ordering better engines.

There was delay in ordering better aeroplanes.

The R.A.F.—Napier 200 h.p. engine was ordered in large quantities before it had passed its tests.

The better engines, when procured, were reserved for the R.A.F., and none were allotted to private firms.

[i.e., for use in experimental aeroplanes, with a view to improving the breed.]

37. Dealing with these allegations in order—The alleged delay in ordering better engines occurred in respect of the 110 h.p. Clerget, the 110 h.p. Le Rhone, and the 200 h.p. Hispano-Suiza engines.

All these engines are admittedly good, and all have now been ordered in considerable quantities.

38. There was, we think, no undue delay in ordering the 110 h.p. Clerget engine. There was very considerable delay in the case of the 110 h.p. Le Rhone engine, and slight delay in the case of the 200 h.p. Hispano-Suiza.

39. The delay in ordering aeroplanes is alleged to have occurred in the cases of the Bristol Scout, Nieuport, and the Sopwith 1½ Strutter. We think there was no delay for which any blame can be attributed to the Royal Flying Corps in any of these cases.

[Then who is to blame for the fact that the 1½ Strutter, which existed in June, 1915, was not ordered at all till Dec. 20th, 1915, and that it was not ordered in quantities till well on in 1916—after the agitation was in full swing?]]

40. We do not think that the delay in ordering the Le Rhone and the Hispano-Suiza engines was attributable to the fact that the Directorate was trusting to the R.A.F. to produce equivalent or better engines. The only engine of its own which the R.A.F. was engaged upon was the 140 h.p. R.A.F., which could not have taken the place of either the 110 h.p. Le Rhone or the 200 h.p. Hispano-Suiza.

41. We are, however, not so much concerned to see whether the rhetorical charge of "too blind faith" is made out as to see whether any blame attaches to the Directorate for the delay and whether the Royal Flying Corps suffered from it.

42. In the case of the Hispano-Suiza engine, negotiations for its production were entered upon promptly and a draft agreement was sent to the company on November 3rd, 1915. The answer miscarried and the matter dropped until February 22nd, 1916, when the Directorate reopened the negotiations and carried them without delay to a successful issue. We think the four months'

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delay ought not to have occurred, although in this case no real harm accrued. The Hispana-Suiza engine was originally one of 150 h.p. They were experimenting with one of 200 h.p. The latter was bought for the Royal Flying Corps, and this engine was not in a sufficiently advanced stage to have been procured earlier.

43. The history of the 110 Le Rhone engine is different. This engine was at first, and in 1915, procured through the French Government, but the French wanted it for themselves and were unable to continue to supply the Royal Flying Corps. It is a difficult engine to build, and a builder had to be found. This took time. Another fact was that it was doubtful whether both the 110 Clerget and the 110 Le Rhone would be wanted, and some time was consumed in comparing the two engines. In the end the Le Rhone was ordered, but after a lapse of some twelve months or more from the time when there was difficulty in procuring them from the French Government. We think this delay was too long, and that it would have been an advantage to the Royal Flying Corps to have been in possession of this engine in quantities earlier.

44. It is the fact that the R.A.F. Napier 200 h.p. engine has been ordered in large quantities, and that these orders were placed before the engine had been proved. General Henderson explained to us that in war time one must sometimes gamble on an engine and trust to luck. This engine was being designed simultaneously with the 250 h.p. Rolls-Royce, upon which the directorate did not gamble. We think the reason why the R.A.F. Napier engine was selected for the gamble was because it was—at any rate, partly—of R.A.F. design, and that this is an instance in which great reliance has been placed on the R.A.F. The engine has been adversely criticised, but whether the faith reposed in the R.A.F. in this case was “blind” or not remains to be seen.

[One hopes that General Henderson does not patronise horse-racing to any extent, for if he makes a practice of “backing wrong ‘uns” on the course as he has done in his connection with aircraft the result of his gambles must be disastrous. The Committee’s phrase “remains to be seen,” is surely ironic, after all the waste of time and material since this engine was started. And was it not announced that the design had been “scrapped” some months ago?]

45. Had the Le Rhone engine been procured earlier, a few might have been spared to private firms in order to see whether they could design an improved type of aeroplane in which to fit it, but we are satisfied that, within the limits of the engines actually available, no undue preference has been given to the R.A.F.

46. Opportunities were given to the Aircraft Manufacturing Company which resulted in the de Havilland Scout. Several important firms are engaged upon experimental machines at Government expense. Other private firms, at the request of the Directorate, have been trying to design machines for certain high-powered engines, including various types of the Green engine, all so far without result. It is obvious that, in designing aeroplanes, opportunity and accomplishment are not interchangeable terms.

47. A salient fact in this connection is one to which we have already referred, namely the stopping of the designing of the 200 h.p. R.A.F. water-cooled engine and handing the drawings to the Rolls-Royce and Napier Companies.

48. In the matter of opportunity, private firms have nothing of which to complain.

[Does the Committee really want instruction in the whole history of Military Aeronautics?]

49. The truth is that a charge of this nature will always be made and will be believed so long as there is one person responsible for the Royal Flying Corps as a fighting force, and at the same time, both for its equipment and for the R.A.F. The position is, in our opinion, an impossible one.

[A thoroughly excellent conclusion.]

Charge 3.

50. (a), (b), (c), (d), are all charges against the R.A.F.

51. It was said that the feeling of the Trade against the R.A.F. was strong and bitter. It may be so, but it is singular that, while several witnesses who were not Trade witnesses spoke to this feeling, the Trade itself was dumb. In the absence of assistance from any Trade witnesses, we have formulated to the best of our ability the charges against the R.A.F. made to us on their behalf. We can only hope that it will be found that we have included, at any rate, the most serious of the grievances to which the Trade feels itself unable to give expression—except perhaps in confidence to a sympathetic friend or in furnishing inaccurate copy for an anonymous newspaper correspondent.

[This little display of feeling against the Trade and a section of the Press mars an otherwise well-intentioned report. As a matter of fact practically all the newspaper criticism appeared in signed articles—only the defenders of the R.A.F. were anonymous or pseudonymous, e.g., “Pegasus,” and “Ornis”—and those who remember the fate of firms which disagreed with the R.A.F. before the War, will understand the dumbness of the Trade.]

Charge 3 (a).

52. The ascendancy of the R.A.F. we have dealt with in our observations on the “too blind faith” charge.

Charge 3 (b).

53. This is the “competitor and judge” charge. Some of the witnesses went so far as to say that the R.A.F. was a competitive manufacturer with private firms. This is so contrary to the fact that we frankly do not believe that any private manufacturers honestly entertain that opinion, and we dismiss the suggestion as frivolous.

[Let us say then “competitor and influential critic.”]

54. The R.A.F. has built no engine except experimentally, and has only constructed for use 77 aeroplanes, of which 50 were to assist a private maker in the fulfilment of an order.

55. The more correct way of stating the charge under this head is as follows:—The R.A.F. designs aeroplanes and engines; private makers’ designs are submitted to the R.A.F. and private makers’ productions are tested by the R.A.F., so that in matters of design and test the R.A.F. is both competitor and judge.

56. The charge so stated is not in accordance with the fact, in that private makers’ designs are not submitted to the R.A.F. Private makers furnish stress diagrams, which are submitted to the R.A.F., and this may have led to some misapprehension. That does not, however, entirely dispose of the charge, and we think there is some substance in it. No one on the actual staff of the R.A.F.—that is, no one from the Superintendent downwards—has any voice in the selection of either aeroplanes or engines. The ultimate decision in these matters rests with General Henderson. He, naturally, seeks advice, and there is an advisory staff whose duty it is to make preliminary investigations into new types of aeroplanes and engines submitted for adoption, to get all the necessary information and details into order so as to be able to report upon these to General Henderson, and to assist him in selection or rejection. General Henderson sometimes also consults some officers of the Royal Flying Corps of special experience. The procedure is that general arrangement drawings are sent to the War Office and are examined in General Henderson’s office by technical officers who take note of engineering points. An experienced pilot, who deals with the supply of aeroplanes, also examines the drawings. The Inspection Department is consulted and General McInnes himself inspects and examines the drawings. The drawings, with the criticisms of these various officers, are then submitted to General Henderson, who accepts or rejects.

[The Committee does not appear to take into account the influence of R.A.F. officials before the war in their capacity, possibly unofficial, as “advisory experts.”]

57. When an aeroplane is submitted for trial it is sent to the Central Flying School and is there tried before the Commandant, two or three officers, and the Chief Inspector of Aircraft. R.A.F. designed aeroplanes are tried in the same way. Engines of private design are tested at the R.A.F. under the direction of the Superintendent.

58. In substance the position is that, although great pains are taken to prevent the R.A.F. from having any direct voice in the selection of types of either aeroplanes or engines, engines are tested by the R.A.F. and most of the persons who advise General Henderson and who try the aeroplanes belong to the department which has the control of the R.A.F., while General McInnes is the head of that department, subject, of course, to General Henderson. We do not see how the feeling of the trade, which we are informed exists, that their designs may not receive fair treatment or their finished products fair tests in competition with those of the R.A.F., can be removed under existing conditions.

Charge 3 (c).—The R.A.F. has been a Dis-service and not a Service to the Royal Flying Corps.

59. The first branch of this criticism in effect amounts to the charge that the designs of the R.A.F., whether of aeroplanes or engines, have not been efficient. That the R.A.F. has produced unsatisfactory designs of aeroplanes cannot be doubted, but the R.A.F. exists to make experiments, and it is inevitable that some experiments must fail.

[But need not be reproduced as standard types.]

60. The R.A.F. has produced many designs which have done admittedly good service. The B.E. 2 type marked a great advance in aeronautics. The F.E. type is good. The R.E. 7, too, has answered its purpose, but upon the question whether in this war the R.A.F. has well served the Royal Flying Corps, the R.A.F. must be judged by its principal achievement, the B.E. 2c aeroplane combined with the 90 h.p. R.A.F. engine. This is the combination which has been used in far larger numbers than any other, and by it the R.A.F. must, in our judgment, stand or fall. Which is it to do? In answering this question, we bear in mind that at the time the R.A.F. engine was produced, the only possible alternative engine of English design was the Green engine, for which no one has so far produced a satisfactory aeroplane. There was no inherently stable machine of private design. The B.E. 2c was strong, the design was aeronautically sound, the drawings were complete. This last circumstance enabled many manufacturers, entirely new to the trade, to build an aeroplane who could not otherwise have done so. Looking at things as they were at the beginning of the war, we adopt the language of one of the witnesses who appeared before us, Mr. A. E. Berriman, the Chief Engineer of the Daimler Company:—

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"The R.A.F. engine and the B.E.2c aeroplane have their defects, but they form a combination that has been instrumental in enabling the Flying Corps to perform invaluable service to the Army in France,"—
service, we may add, which would in our view have been impossible without this combination, at any rate, for many critical months.

[This will doubtless be entertaining reading to many of the older R.F.C. pilots. Further, it is to be regretted that the Committee does not here take into account the immense waste of time and material in producing B.E.s. and R.E.s. of various types, owing to the errors and alterations in design, when better machines could have been had in greater quantities for the same expenditure of man-power. Mr. Berriman is better known as a journalist than as an aeroplane designer, so one fails to see why his opinion should carry such extreme weight.]

61. Much of the criticism of the B.E.2c machine fitted with the R.A.F. 90-h.p. engine has been ill-founded. As an illustration of this, we may refer to the evidence of one of the witnesses who stated that he was absolutely convinced that a tractor engine is worse than useless for night-flying, and that it was either negligence or ignorance of the authorities to allow night-fliers to use tractors such as the B.E.2c.

62. It is a striking commentary on this evidence that all the three airships which were brought down in flames on the nights of September 2nd, September 23rd, and October 1st last were brought down by pilots flying B.E.2c machines fitted with R.A.F. engines.

[But engines very different from those used in France at the time of the agitation which produced the Committee, and even now carrying far less load, and without the demand for the exertion of full power all the time they are in the air, as in the case with flying in daylight over hostile territory.]

63. It is proper to add that stable machines are admitted to be essential for night flying, and the only machines that are now used for that purpose are the B.E.2c, a tractor, and the F.E.2b, a pusher, both of which are essentially stable.

64. The later productions of the R.A.F. are not, on the whole, as good as some of the machines now produced by private manufacturers, but are more readily obtainable.

[Why?]

65. In arriving at our conclusion on the B.E.2c aeroplane fitted with the 90-h.p. R.A.F. engine, we have not forgotten the complaints that, after the drawings of the B.E.2c and the 90-h.p. R.A.F. engine were sent to the manufacturers, they were constantly being altered in detail, thus creating delay and confusion. There were, in fact, more alterations than one would expect. These, however, were, to some extent due to the desire to meet manufacturers' own views and objections, and to the fact that it was felt to be necessary to supply aeroplane makers, many of whom had no previous experience, with the most exact drawings, even of the smallest altered parts. In the case of the engine, we think this was overdone, and it would have been well to have given a freer hand and more initiative to the drawing and designing staffs of the engine builders, many of whom, though new to aero engine work, had long experience in motor engine building.

66. The second branch of Charge 3 (c) is that the R.A.F. has discouraged private manufacturers. The evidence of three of the four manufacturers who appeared before us is all the other way, the fourth did not refer to the point.

[One would like to know the names of the manufacturers before assessing the value of their evidence.]

67. In several cases, makers of aeroplanes and engine builders, new to the work have sent their foremen to the R.A.F., who have obtained there much useful information and instruction. The testimony of one of these trade witnesses, a large contractor, is worth quoting:—

"It would be impossible for me to go away from this committee without expressing the gratitude which I feel towards General McInnes and every officer of every department, from the head of the War Office to the bottom of the War Office, for the assistance which is given to me. There is every possible ambition to help me to succeed in the very difficult work which I am doing, very often under very difficult circumstances, and I for one would dissociate myself from any adverse proposition in respect to General Henderson and his staff. People say that they do not seem to help manufacturers and contractors, but I have had nothing but the utmost possible assistance that a human being could have."

[That is how to assure further orders.]

68. On the other hand, General Henderson complained that the tact and judgment of some of the subordinate officials of the R.A.F. had been deplorable, and we can well believe that some private manufacturers who came into contact with these subordinate officers have genuine cause of complaint. Indeed, we are inclined to think that this lack of tact may be answerable for much of the dissatisfaction which the Trade is alleged to feel.

[A thoroughly excellent comment, for which General Henderson deserves thanks. One only regrets that it took him so long to make the discovery and to take action accordingly.]

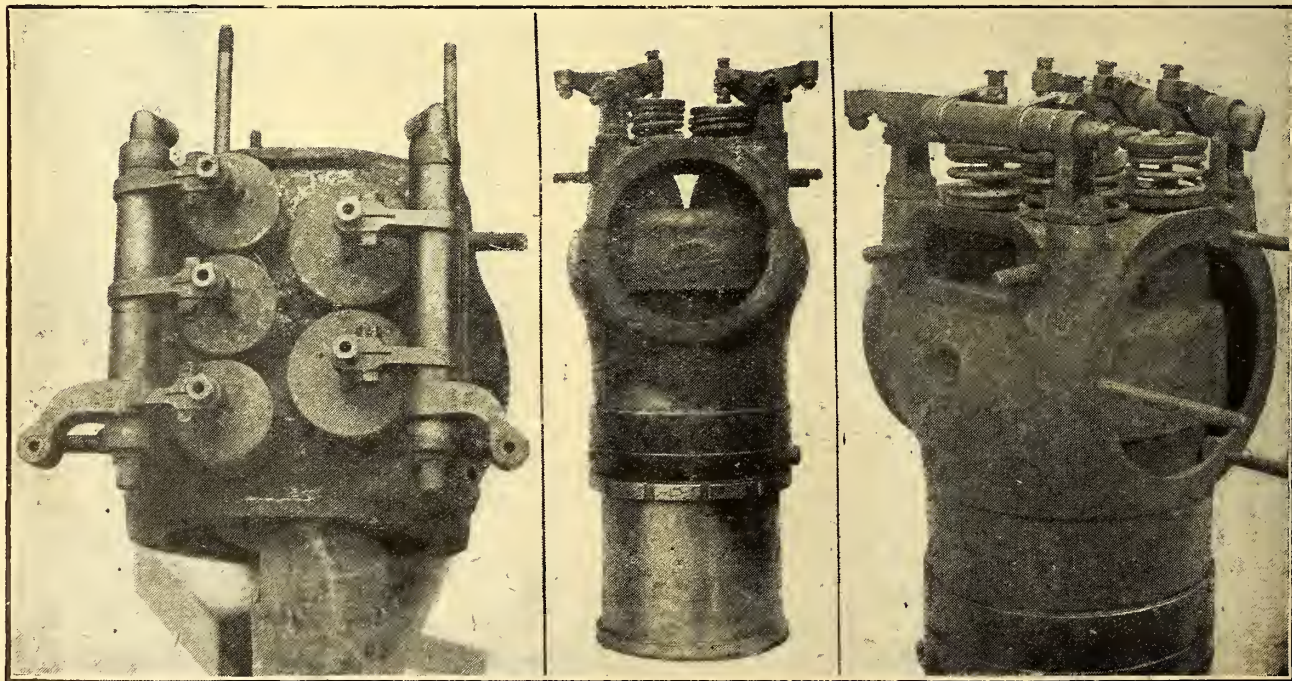
Charge 3 (d). Manufacturers' Designs have been copied by the R.A.F. for their own use.

69. There was one regrettable instance of an attempt to do this. We have investigated the matter thoroughly, and are satisfied that, as soon as it was known to the highest authority, it was immediately stopped, and measurements which had been taken of the section of the wing of an aeroplane were destroyed.

[That is to say the Committee was only informed of one such regrettable instance.]

Charge 4.—The Insufficient Training of Pilots and Observers.

70. Much was said about the insufficiency of the training of our pilots in flying, bomb-dropping, and in fighting in the air. Instances were given of pilots being sent to the front after only five hours' flying. There is no doubt that in the early days of the war, when the demand for pilots suddenly and enormously increased, some were sent out with insufficient experience in flying. This was inevitable in the situation in which the Royal Flying Corps found itself, and no blame can be attached to it in this respect. It follows that pilots were also inexperienced in bomb-dropping and in fighting in the air. Observers were, for the same reason, insufficiently trained.

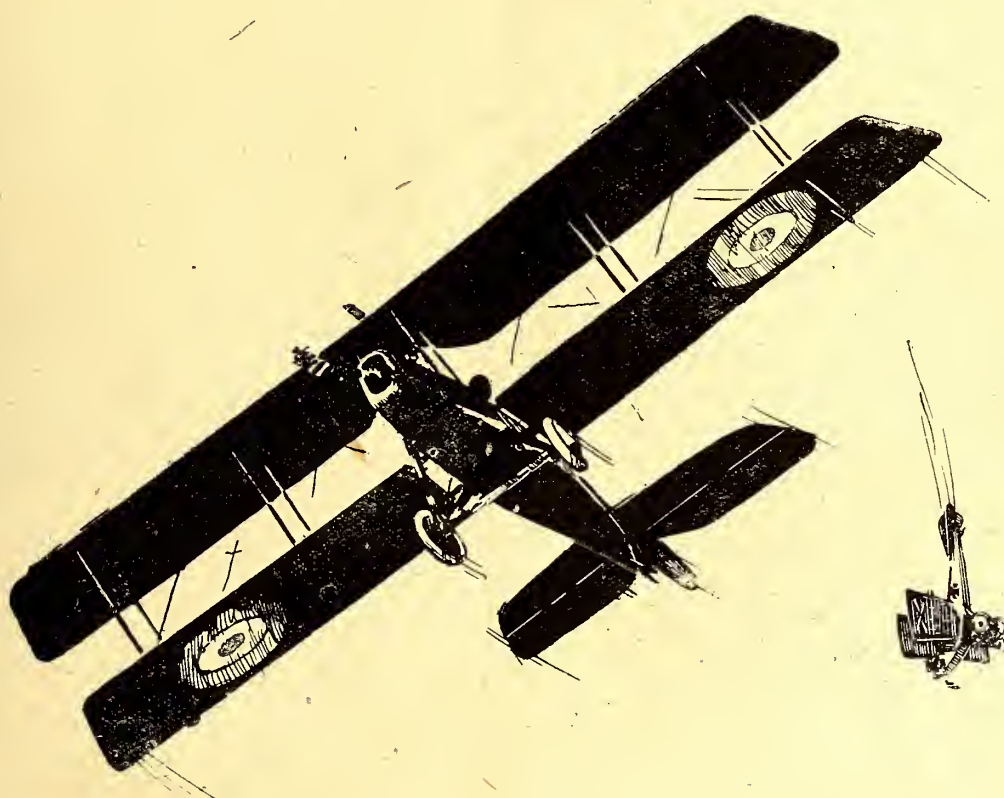


(Admiralty Photograph, published by courtesy of the Air Department.)

The Cylinder Design of the 240 h.p. Maybach Airship engine. On left, top view showing the three exhaust valves and two inlets. In centre, end view of cylinder. On right, three-quarter view of head, showing inlet port.

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71. The most strenuous efforts have been made to remedy this state of affairs, and the present system of training pilots, except in regard to fighting in the air, meets with our unqualified approval. Training is still, however, hampered to some extent by shortage of instructors, as well as by shortage of school aeroplanes, which explains the fact that there is still a long waiting list of would-be pilots. Such steps as are possible, having regard to the demand for pilots and aeroplanes for more imperative needs, are being taken.

72. There was no school for air fighting until September, 1915, when a small one was established at Hythe. There was no doubt a shortage of machine guns, but that shortage does not account, in our opinion, for the fact that the war had been proceeding for over a year before an aerodrome was fitted up for aerial musketry, and then a by no means sufficient one. Why this aerodrome was not opened for aerial musketry sooner is not apparent, but it is evident that the provision of others has, up to now, proved an almost insurmountable difficulty. To provide an area of safety a very large tract is required—and this is not easy to acquire in a thickly populated country like the British Isles—but the problem should, we think, have been solved long ere this.

[This is not exactly high praise for the High Command. But recent progress under the present control is extraordinarily fine.]

73. There have been many cases of pilots and observers having to fight in the air without a sufficient knowledge of their weapons; but although all receive a fair training in this respect now, the training would become much more efficient if special aerodromes were developed for the purpose.

74. In reading the records of the flying in France, we have been much struck by the frequency with which machine guns are reported to have jammed in the earlier days of the serious fighting in the air, as well as by the apparent inaccuracy of the shooting. The latter view we have formed from the large number of rounds fired—often at very close quarters—without apparently any effect; and we may remark that inaccuracy of fire from the German guns is equally apparent. It is well known that jamming of machine guns is, and always has been, a matter of common occurrence, and, further, that accurate fire from one rapidly moving object against another rapidly moving object is extremely difficult; but it is also known that improvement in both directions comes with careful training. It was largely a result of the careful musketry training of the Army in peace time that British troops were able to hold their own against the superior numbers and the less expert riflemen of the Germans in the first battles of the war, and we consider that similar careful training of British airmen in aerial musketry would prove an equally important factor in battles in the air.

It is gratifying to note that while during this year there have been a very great number of fights in the air, the number of reported cases of jamming of machine guns has very greatly diminished, and, indeed, has now, so far as we have been able to ascertain, become almost negligible.

76. In connection with the training of pilots, it has been suggested that a School should be established in some place where the climate would admit of more hours of flying per day than does our own, especially in winter. The south of France was spoken of. We understand this is a suggestion which has been receiving attention and is being acted upon.

[One seems to recall that Mr. Pemberton-Billing advocated such a school quite early in the war.]

77. Some complaint was made that civilian training schools for pilots had not been taken advantage of to the full extent. We are satisfied that this is not so, and that everything possible has been done, and is being done in this respect.

["Has been done and is being done" it is true, but it was not done till quite recently, and then only after six months of agitation by this paper and in Parliament. Before that the civilian schools and their training were utterly despised.]

78. Observers, in the early days of the war, were of necessity employed without experience. As the war proceeded, this defect was gradually remedied. Observers are mostly drawn from the fighting officer ranks of the Army, and now they become observers on probation before qualifying for the post of trained observers. The training seems to us fairly satisfactory, except in regard to the use of the machine gun and fighting in the air.

79. The importance of the observer cannot be over-estimated, and this work is said, on unimpeachable authority, to be more difficult and more trying to the nerves than that of the pilot. The observer too must have sufficient military training to be able to recognise what is of real military interest, such as formation of troops, trenches, batteries, suspicious hostile movements, and the like. He must also have sufficient knowledge of artillery fire to be able to judge its effect and report for the guidance of the gunners below. In addition, he must understand photography, bomb-dropping and his machine gun.

80. A very special combination of knowledge and alertness is thus required, and it seems strange that no encouragement by way of promotion is offered to the observer, unless he becomes a duly qualified pilot. The result is that observers of experience frequently give up their duties at the front, where their experience

is badly wanted, and come home to learn to fly and take a pilot's certificate.

81. We consider that, after the war, the ideal to be aimed at is that pilots and observers should be interchangeable. Meanwhile, we think more encouragement should be given to the observers to remain observers, and we later make a recommendation to that end.

[Observers are now qualified to command units without themselves being pilots.]

Charge 5.—Home Defence.

82. A good deal of confusion has arisen upon the subject as to whether the air services of the Army or the Navy are responsible for Home Defence, or whether the responsibility is divided. The truth is that the Navy was entirely responsible till the middle of February last. Since that date the responsibility has been divided. The Navy is responsible until hostile aircraft reach our shores. From that time the Army is responsible. It is hardly necessary to state that if a Naval machine was attacking hostile aircraft it would not cease to do so because the aircraft crossed the boundary line (high water mark), nor would an Army machine cease to pursue hostile aircraft when it passed over the line seawards.

83. The Royal Flying Corps is not responsible for anti-aircraft guns. It has no control over them. Nor has it any responsibility for or control over the searchlights which work in connection with those guns. The Royal Flying Corps now has, however, its own searchlights wherever Home Defence machines are maintained.

84. The defence of the London Area is under the immediate control of the Commander-in-Chief for Home Defence. In other areas, subject to his general control, it is under that of the Army officers in command of the particular anti-aircraft defence areas. Those areas are not co-terminous with the districts commanded by the officers in charge of Home Defence from attacks other than by aircraft.

85. We have appended a Memorandum on the subject of Home



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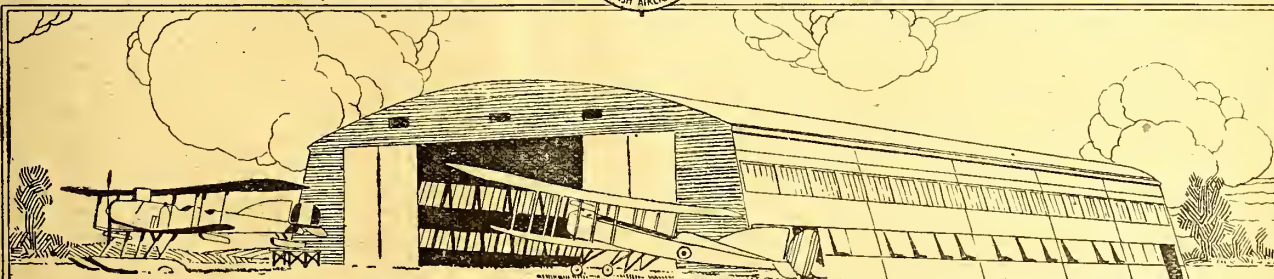
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Defence* going more into detail than seems advisable in the body of this Report.

86. It seems desirable to mention that, while the Navy are still solely responsible for Home Defence, Lord Kitchener issued an order that Army aeroplanes were to render all possible assistance, an order which was very willingly obeyed.

87. The Navy have aerodromes for their own purposes along the coast, and we think it reasonable to assume, although we have no knowledge on the subject, that, now that the Army is responsible for Home Defence from the coast inwards, a similar order has been issued to the Navy.

88. Having regard to the limitations imposed by the number of aeroplanes, pilots and night landing-places as yet available, we do not know that, so far as the Royal Flying Corps is concerned, anything more can be done.

[What has been done has been done excellently, and there seems little more to be done, except to provide better machines.]

89. It ought, we think, to be generally known that Home Defence machines and pilots are not now stationed at every aerodrome. It must not be supposed that, because aeroplanes are seen flying freely day by day from a given aerodrome, there are necessarily any aeroplanes kept at that aerodrome fit for night-flying or any night-flying pilots there to fly them. Home Defence machines, with their pilots, are now grouped at various centres, a plan which, after careful consideration, we approve.

Charge 6.—Loss of Mastery in the Air.

90. This charge relates to the period of some six months, beginning in about October, 1915, when the German Fokker machine made its appearance.

91. For more than a year after the beginning of the war there was practically no fighting in the air. Our machines made their reconnaissances with regularity and without serious molestation. Then suddenly the German tactics changed. They produced the Fokkers—fast, handy, fighting machines that lay in wait for our machines and mobbed them. We were slow in recognising this change of tactics and slow in adopting means to protect our reconnaissance machines, with the result that we suffered many casualties. As an instance, there were 12 deaths in the first half of March last. The casualties, however, were not all on our side. The German losses during the six months in question were heavier than ours, and equally heavy in any given month, which is remarkable, as it is clear from the evidence that British airmen carried out far more work over the enemy's lines than the Germans did over ours.

92. The B.E. 2c was our chief reconnaissance machine, and it was to fliers of that machine that most harm was done. The B.E. 2c was not so fast or so handy as the Fokker, and needed, after the appearance of the Fokker, to be escorted by fighting machines. This is now being done.

93. Reports from the front are singularly diverse as to the extent to which superiority was for a time lost. The battle-front was a long one, and it is obvious that, as was to be expected, the state of affairs differed considerably at various parts of the line. In some places the German superiority for a time seemed marked, in others it was non-existent.

* Not printed.

94. Such local inferiority as there was seems to have been chiefly due to our tardy recognition of the change brought about by the Fokker, but we think that, although we had at the front at all times machines capable of dealing with the Fokker on at least equal terms, these machines were not at first available in sufficient numbers.

95. Our temporary loss of superiority has been described in language of such gross exaggeration as to make us at first disposed to think there was nothing in it; but a careful examination of all the facts leads us to the conclusion that the charge is true to a limited extent, and in the sense indicated.

96. Our newer aeroplanes, which are now coming forward in greater numbers, are proving individually superior to those of the Germans; and, while there must be casualties where there is fighting, our early superiority has been more than regained.

[Which is about as close an agreement with criticism as any critic could wish.]

Charge 7.—Various Defects in Aerodromes and System of Lighting Landing Grounds.

97. The chief complaints against aerodromes and night landing places were that they were insufficient in number, some of them too small, and some of them unsafe by reason of the surface being rough, such as ridge and furrow, or intersected by hedge-rows or dykes.

98. Most of those complaints related to the earlier period of the war and, except as to size, were probably well founded. They afford another instance of the unpreparedness of the Flying Corps for a war of this magnitude.

99. We are satisfied that the Royal Flying Corps has done all that could be expected of it in the way of increasing the number of aerodromes and landing places, and in the way of their improvement, especially when the shortage of available labour is taken into account.

100. Perhaps Hythe is the least satisfactory instance, where the trouble from dykes is only just being surmounted.

101. The Dover aerodrome was criticised because of its situation on the top of high cliffs. It was stated that in landing inexperienced pilots had difficulty in keeping the nose of the machine sufficiently high. On the other hand, pilots whom we interviewed on the subject were quite satisfied with it. Some of them indeed were loud in its praises. We see no reason for closing it.

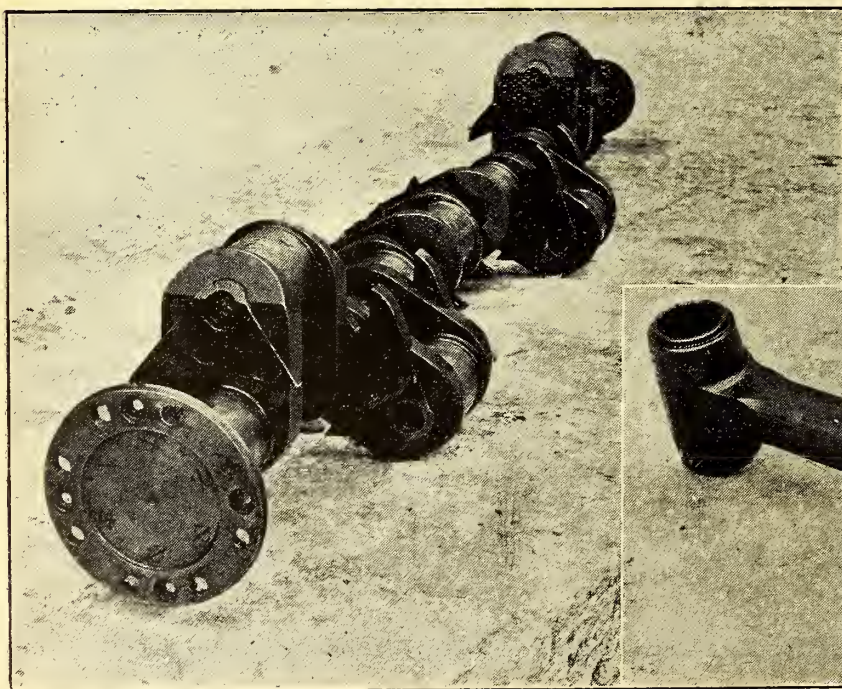
102. The only aerodrome which can be criticised on account of its size is Croydon, which measures 500 yards by 460 yards. This is, judging by other aerodromes, on the small side, but is, we think, reasonably sufficient.

103. Night-flying is, as far as possible, forbidden at aerodromes where the state of the surface is such as to present unusual difficulties on landing.

104. We think the landing ground and aerodrome problem has been, upon the whole energetically and skilfully tackled.

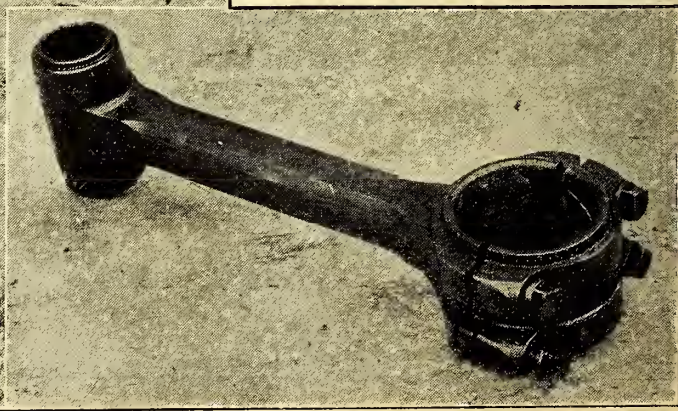
105. The complaint about lighting is that the British system is inferior to the French and German systems.

106. All three systems are different. The British is by petrol flares. The French is by electric light. The German is said to be by powerful searchlights slightly shaded, directed up wind along an aerodrome.



The Crank-Shaft and one of the connecting-rods of the 240 h.p. Maybach Airship Engine.

(Admiralty photograph, published by courtesy of the Air Department.)



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107. It is inadvisable to discuss the British or French systems in detail. Of the German system little is known. There is an unanimous consensus of opinion among all the many pilots whose opinion we asked that the British system is a good one, that they are satisfied with it, and do not desire a change. Many of them pointed out the well-known fact that, when the weather is at all thick the yellowish flame of a petrol flare is easier to see than an electric light, even though the latter is transmitted through coloured glass.

In a recent experiment at Upavon, a new system, called "Triplex glass landing lights," proved to be inferior to petrol flares.

108. We see no reason to suggest any change and find no present ground of complaint.

Charge 8.—The Inadequate Arming of Aeroplanes.

109. When this great war was sprung upon the country, the question of using aeroplanes for more than reconnaissance and observing artillery fire, as also the important part machine guns were going to play both in the air and on land, had hardly been considered. Provision had only been made for an extremely limited number of machine guns for existing cavalry regiments and infantry battalions, and none for the enormous quantities which were to be required later. It was a long time before the necessary machinery for meeting this great increase in output could be provided and, as the guns became available, the comparative urgency of supplying the land and air had to be dealt with. Thus, it was March or April, 1915, before the squadrons at the front got four-fifths of their complement of machine guns. Even then, however, and indeed up to a much later date, it was not considered possible to supply the requirements at home.

110. In the absence of machine guns there was nothing for it but to arm the men in the machines with rifles, and this is what really happened; it is on this largely that the complaints appear to be based.

111. The provision of weapons such as machine guns, bombs, hand grenades, darts, etc., fell under the able hand of the Master-General of the Ordnance; and the Committee are unable to find any delay on the part of the Royal Flying Corps in making use of any of these, or in providing mountings, racks, etc., for them, within a reasonable time of their being allotted to the Corps. Experiments had to be made; and in some matters considerable time spent, before the most suitable way of carrying the several war requirements in aeroplanes was discovered, if indeed it has been discovered yet.

112. We have now dealt with what we have described as the charges of a general character against the Royal Flying Corps, and proceed to a number of specific charges of alleged maladministration and slackness.

Specific Charges.

113. The specific charges and criticism which we propose to discuss are:—

- (a.) (1.) Pilots are allowed to fly "dud" machines home from France.
- (2.) Insufficient attention is paid to the condition of training machines and of their equipment.
- (3.) Machines are, or have been, flown at the front overloaded with all kinds of equipment and apparatus. They are called "Christmas Tree" machines.
- (b.) (1.) Failure to buy machines and engines from America.
- (2.) Failure to utilise English firms to the best advantage, e.g., The Sunbeam, The Vauxhall and The Rolls-Royce.
- (c.) The representatives in Paris of the Royal Flying Corps and the Royal Naval Air Service worked very badly together, and were not on speaking terms.
- (d.) Zeppelins ought to be raided in their sheds.
- (e.) All machines carrying an observer should be fitted with dual control.
- (f.) Pilots have not been provided with proper maps, compasses or altimeters.
- (g.) General Henderson opposed the building of airships.
- (h.) General Trenchard had no sufficient training in flying.
- (i.) General Henderson declined to allow Lewis Guns to be sent to the French in exchange for engines.
- (l.) General Henderson
- (m.) There is excessive flying in order to create a misleading record.
- (n.) No machines went up on the occasion of the Dover Raid in January last.
- (o.) The day after Mr. Pemberton-Billing's Election, 74 pilots were sent home for further training.
- (p.) The following cases of accidents and misadventures:—
 - (1.) The mishaps to machines on January 31st last.
 - (2.) The mishap to the De Havilland Squadron.
 - (3.) The landing of an F.E. 2b machine with a Rolls-Royce engine at Lille, instead of St. Omer, on June 1st last.
 - (4.) The death of Second-Lieutenant Yates (No. 14 Squadron) in Egypt. Wings of aeroplane folded up in the air.
 - (5.) The deaths of Lieutenant H. A. V. Hobbs and Second-Lieutenant Tudor Jones flying a Morane Parasol in December, 1915; and later, Lieutenant Palmer, engaged in a long reconnaissance accompanied by a Morane Scout, shot down by the enemy flying a faster machine.

(6.) Second-Lieutenant Tennant's case.

(7.) Second-Lieutenant Chamberlain's case. Killed owing to the breaking of the right wing of his aeroplane in the air.

(8.) Second-Lieutenant Collier, said to have lost his way on October 22nd, 1915, owing to the absence of suitable map and compass. He landed with new Morane at Louvain, and was captured by the enemy.

(9.) Lieutenant Downer: Alleged faulty construction of aeroplane.

(10.) The faulty machine sent from Beaulieu to Hythe.

(11.) The fatal accident to Captain Allen and Mr. Burrows.

(a.) 1.—"Dud" Machines, and (a.) 2. Insufficient attention to the Condition of Training Machines.

114. There is room for improvement in these respects. Pilots coming home prefer to fly; and, when not closely watched, have now and again taken risks to which they ought not to be allowed to subject themselves. It is the business of Flight Commanders to see to these matters, and cases have occurred where experienced pilots have been allowed to do as they please. There have also been certain instances where instructors appear to have considered that, for short training flights, a few defects in the condition of the machine and of its equipment are of little consequence. The pupils in training do not care to complain. They are afraid of being accused of "cold feet."

115. Instances of the flying home of "dud" machines were given us. One was of a pilot who, wanting to get home from the front quickly, flew a machine which had a forced landing in France owing to engine trouble; but so anxious was he to get home that he came on and happened to arrive in safety.

116. A bad instance of the neglected condition of upkeep of a school machine was the case of a machine sent from Beaulieu to Hythe for use there as a school machine.

117. Another instance was the failure to provide a pilot with satisfactory light for his instruments on the occasion of his making his first trial night flight.

118. The attention of Flight Commanders and of Squadron Commanders should be drawn to the importance of taking no chances even in the shortest and safest flights. Accidents may so easily and unexpectedly happen, although we are not aware of any case in which an accident has, in fact, happened from either of the causes mentioned.

[Quite satisfactory from the critics' point of view].

(a) 3.—"Christmas Tree" Machines.

119. Several witnesses complained that machines had been overloaded with all sorts of apparatus. This sometimes happened in the early stages of the war, when aeroplanes were few and all kinds of work required to be done. The pilots wanted to do it. A pilot thought he might meet a German in the air, so he took a gun. He delights in bomb-dropping, and thought he might see a German battery or column, so he took some bombs. He often had to take wireless apparatus, and sometimes took it on the chance that it might be useful, and he would strap a camera on as well. The machine was so overloaded that it would neither climb fast nor fly fast. This was due to over-zeal on the pilot's part. Individual pilots were stopped when they were seen overloading their machines, and the practice was put an end to early in the war by an order that, of the four impedimenta mentioned, no pilot was to carry more than two at any one time.

[A very sound regulation].

(b) 1.—Failure to Buy American Machines.

120. The purchase by the Admiralty, at the outbreak of war, of Curtiss machines and engines was a discouraging experience. Considerable inquiries were, however, made in America in other directions, but the reports were adverse, and the experiment was not repeated, we think wisely.

[This was rather the fault of the Admiralty in sending out the wrong people to supervise the production of machines and engines.]

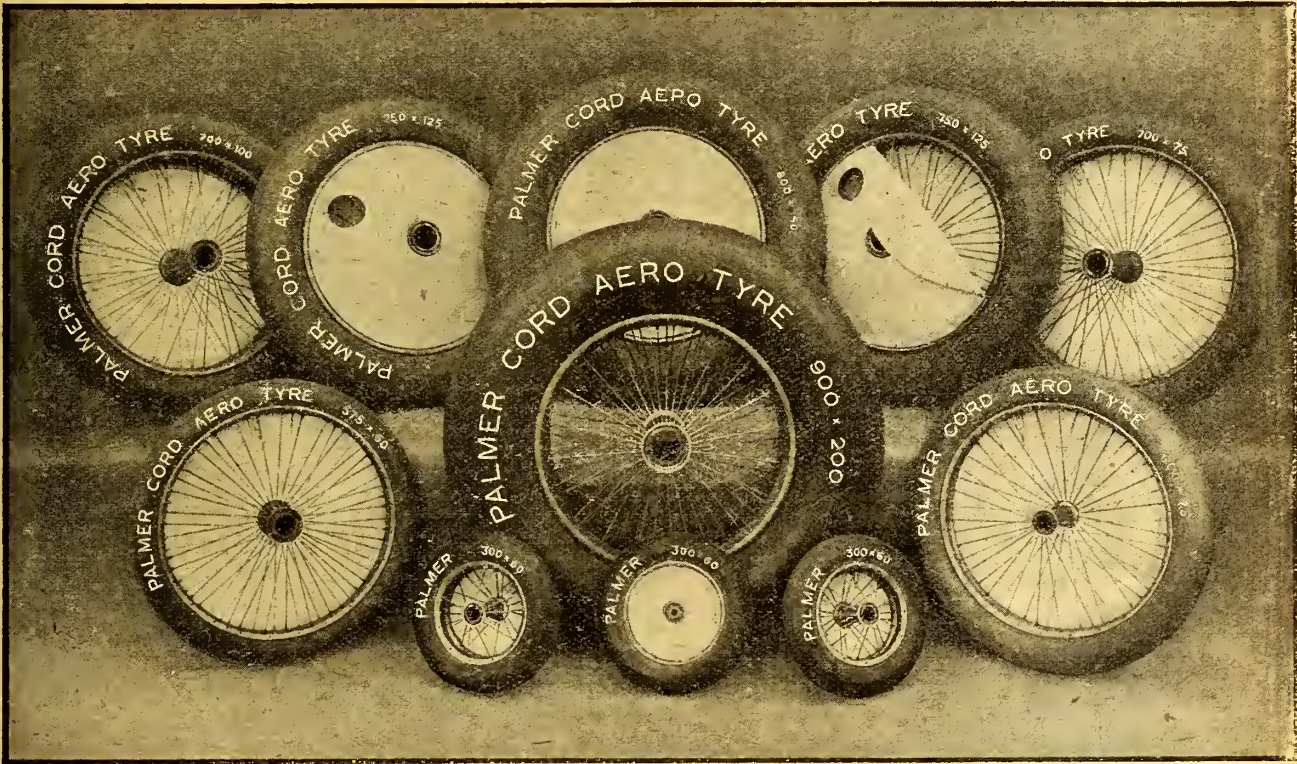
(b) 2.—Failure to utilise Certain English Firms.

121. At the outbreak of war the firms known or thought to be capable of building engines were, by arrangement, divided between the Royal Flying Corps and the Royal Naval Air Service. The Sunbeam firm was allotted to the Navy, and have now turned out a good type of high-powered engine.

122. The Vauxhall firm have been employed in making shell for munitions. There is an arrangement with the Ministry of Munitions by which the Vauxhall Company can be released from shell making and take up engine building. The Royal Flying Corps, at the instance of General McInnes, has been keeping the Vauxhall Company in reserve for making the Rolls-Royce engine under licence or the 200 h.p. R.A.F. engine. We see no objection to this, except that we do not think it wise to give further orders for the 200 h.p. R.A.F. until it has been more fully proved.

123. The Rolls-Royce case stands thus: The Royal Flying Corps gave them the experimental order for engines to which we have referred. The Admiralty then stepped in and gave them large orders and extended their works. The company then applied to the Royal Flying Corps for further extension. It happened that Messrs. . . . had at that time an engineering shop becoming

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"	17	72.39	12.7	Central	"	20	178.	38.09	132/46	"	26	150.	40.	Central
450×60	30	89.	31.75	Central	"	75	178.	31.75	132/46	"	33	150.	38.09	Central
575×60	14	150.	38.09	104/46	"	80	178.	44.45	132/46	"	38	178.	38.09	132/46
"	21	160.	28.	Central	700×100	2	185.	55.	135/50	"	66	178.	38.89	132/46
"	34	150.	31.75	104/46	"	4	185.	55.	Central	800×150	8	185.	55.	135/50
600×75	14	150.	38.09	104/46	"	18	178.	44.45	132/46	"	10	185.	55.	Central
"	21	160.	28.	Central	"	26	150.	40.	Central	"	36	185.	55.	135/50
"	34	150.	31.75	104/46	"	33	150.	38.09	Central	"	40	185.	60.32	135/50
					"	38	178.	38.09	132/46	900×200	42	185.	60.32	125/60
					"	66	178.	38.89	132/46	"	47	185.	55.	125/60
					750×125	2	185.	55.	135/50	1100×200	52	185.	55.	116/69
					"	4	185.	55.	Central	"	57	185.	55.	Central

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vacant, with tools and labour ready to hand. General Henderson preferred to try to arrange for Messrs. . . . to build the Rolls-Royce engine under licence, but the terms sought to be enforced by the Rolls-Royce Company were unacceptable to Messrs. . . . and the matter fell through. We think that General Henderson acted quite rightly.

124. It is certainly a wise policy not to depend exclusively upon any one firm for the building of an engine of a given type. Labour trouble, Zeppelin raids, or a variety of happenings, may interfere, and it is better not to have all one's eggs in one basket, especially when the eggs are engines.

125. We are not in a position to express any opinion upon the merits of the dispute between the Rolls-Royce Company and Messrs. . . . ; but the incident indicates one of the difficulties in making the business arrangements necessary for procuring engines of private make in quantity—a difficulty from which engines of R.A.F. design are free.

[It also indicates the advisability of compelling firms to produce what is needed in war time on equitable terms].

(c) **Inharmonious Working of the Representatives of the Royal Flying Corps and Royal Naval Air Service in Paris.**

126. In the early days of the war, when both Services were very dependent on the French for supplies of aeronautical material, including machines and engines, two officers were sent to Paris to procure all the supplies they could. One represented the Royal Naval Air Service and one the Royal Flying Corps. Each tried to do his best for his own branch of the Service. This led to their being often in competition with each other and to much friction between them. The friction was the result of the competition. The spectacle presented was unedifying. These two gentlemen acted, and were bound to act, as if they were buyers for rival firms of contractors instead of buyers for a Service divided, truly, into two branches, but, after all, a national Service whose efficiency in both branches was equally vital to the nation. Fortunately, prices were fixed by the French Government and were unaffected.

127. This vicious system of competition for our aeronautical supplies in France has been altered, and the sensible plan adopted of charging one representative with the duty of buying for both Services. It is to be regretted that this sensible and obvious system was not adopted from the first. The competitive system was, no doubt, adopted in deference to the jealous desire to keep each branch of the Air Service separate from the other in every respect. We deprecate this feeling, of which we have had several instances, but whether both branches of the Service are to blame, or only one, we are unable to say.

(d).—**Zeppelins should be Raided in their Sheds.**

128. As to this, suggestions were made that the best way of defending the country against Zeppelin and other airship raids was to destroy the Zeppelins at their bases and in their sheds. There were also other suggestions for raiding industrial centres in Germany. Most people would agree with the suggestion that Zeppelin bases should be raided, if possible, while opinion on the desirability of raiding industrial centres is very divided, and we merely mention the suggestion without comment.

129. The great advance of the German Army into France and Belgium has had the effect of making the journey to many of the Zeppelin bases longer than was anticipated, but we have now machines at the front capable of raiding many of the nearer bases. No doubt, as the higher-powered engines now coming forward begin to be delivered in quantities, the Royal Flying Corps will be still better equipped for the purpose, both as to length of range and carrying capacity.

130. The decision as to whether machines should be used for the purpose does not rest with the Royal Flying Corps, who can only act at the front under the orders of the Commander-in-Chief of the Army, and regard must doubtless be had to the demand for aeroplanes for other Services.

131. The suggestion appeals to us as being sound, and we make no doubt has been, and will be, carefully considered by the proper authority.

[Once more the critics score. Will the R.N.A.S. kindly note?]

(e).—**Dual Control.**

132. The dual control point is closely connected with the training of observers. The object of dual control is to provide the observers with a control stick or lever so that, in the event of the disablement of the pilot, the observer may be able to fly the machine to some landing-place and land it in safety. Pilots at first objected to dual control on the ground that an observer might be tempted to exercise control while the pilot was himself flying the machine and thus cause accident. This objection is wearing away, and pilots are now becoming reconciled to the idea, and even look upon it with favour. Dual control is more easily fitted to machines which carry the pilot in front, but there is no serious difficulty in fitting dual control to all machines which carry a pilot and an observer. The dual control stick should be detachable with a bayonet socket, and should not be placed in position until the need for using it arises. If dual control is to be effective observers must have some elementary training, at any rate, in flying. Subject to these observations, we agree with the growing feeling in

favour of dual control, and do not gather that the Heads of the Royal Flying Corps desire to raise any objection. It was wise not to move strongly in the matter until pilots became reconciled to the idea.

[Reference to THE AEROPLANE of something like two years ago may be enlightening].

(f).—**Maps, Compasses and Altimeters.**

Maps.

133. The question of maps has been unfavourably commented on and some witnesses consider that, if maps had been clearer, pilots would have found it easier to recognise places, and an accident, such as occurred on May 31st last, when Lieutenant Littlewood lost his way and was captured with his machine in Lille, would never have happened.

134. The Directorate have had great trouble in getting suitable maps, owing to the fact that air operations extend over so many different countries, the maps of which differ in style and scale. For instance, in the course of a flight, machines frequently pass over parts of England, France and Belgium. On the whole, though the construction of maps was necessarily rather slow, we do not consider that any fault can be found with the Royal Flying Corps, nor can we attribute the loss of the machine in Lille to the map, which was the same which all pilots flying across to France use, and seems to us reasonably sufficient.

135. Some further adverse comment has been made by witnesses because the maps for the theatre of war have not been constructed on the process by which Lord Montagu has produced maps for air pilots over this country. There are several reasons given why these undoubtedly excellent air pilot maps have not been constructed, and with these we are in sympathy. (a) The process was a private invention and quite unknown to the Military Authorities until December, 1915.

[Were the Military Authorities asleep?]

(b) Even if the invention had been known, it could not have been adopted for military pilots, as it is essential, whilst learning to fly, that the latter should use the same type of map as they will find in vogue in the theatre of war. (c) To produce maps of the theatre of war on Lord Montagu's plan would take time, though it could probably be done. (d) The maps, if produced, would be useless owing to its being essential for the purpose of orders, reports, descriptions, etc., that pilots should use the same maps as the Army to which they belong unless Lord Montagu's maps should prove to be suitable for the ordinary work of an Army. This we think possible, although they have not yet been adopted. [Anyhow, if a pilot or observer cannot read an ordinary operations map he is not fit for his job].

Compasses.

136. The provision of a suitable compass has presented very real difficulties, and only quite lately has it been possible to invent a really satisfactory one. It appears that the twisting and turning of an aeroplane are so sharp and sudden that no existing compass was trustworthy in an aeroplane; and it has been urged that an indifferent compass was useless, and that the number of high-class compasses was very limited. There are certainly instances in the earlier days of the war of machines flying without compasses owing to there being none to give them; and, later on, isolated instances due to the negligence or rashness of local officers who were responsible for seeing that a machine was properly equipped before leaving the ground. Some of these cases will be found commented on in this Report.

Altimeters.

137. The complaint that altimeters were limited to registering a height of 10,000 feet, and that they burst if an aircraft rose above that height, appears to be borne out by fact, and, here again, was a surprise of the war. When hostilities commenced 10,000 feet was considered an ample maximum height, but the range and accuracy of anti-aircraft guns increased, until machines were hit at over 20,000 feet, and the range of the altimeter had to be increased. Consequently, there was a period when there were no suitable altimeters for flights above 10,000 feet, but the Committee have no reason to suppose that the period was unduly protracted.

(g).—**General Henderson opposed the Building of Airships; and**

(h).—**General Trenchard had no sufficient Training in Flying.**

138. Both these charges are quite unfounded.

(k).—**General Henderson Declined to allow Lewis Guns to be sent to the French in Exchange for Engines.**

139. Upon this charge we quote General Henderson's answer, which we accept. General Henderson said:—

"I was accused of having stopped that, or interfered with it. Major-General Sir Stanley Von Donop, M.G.O., deals with that in the following minute:—'Continual strong recommendations have been received from the General Officer commanding Royal Flying Corps, that Lewis guns should be supplied to him for issue to the French. On these recommendations the number allocated to Royal Flying Corps was varied at various times in order to meet the demand. In addition to the guns thus received by the French Aviation

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Department from the Royal Flying Corps, special issues have been made at times by the War Office.”

General Henderson added:—

“It is one of the things that I have taken more trouble about than anything else, and I have even cut down Lewis guns for our own aeroplanes in order to supply them to the French, because I looked upon it that it did not matter who brought down the Germans, whether it was our own aeroplanes or Frenchmen’s.”

(1).—GENERAL HENDERSON

140. Here, again, we accept General Henderson’s answer,

(m).—Excessive Flying to create a Record.

141. A record is kept by every squadron at the front showing the number of hours flown per diem by every aeroplane. A record is required in order to be able to trace the nature and length of duty on which every aeroplane has been employed. The record enables the life of a machine and engine to be ascertained. It provides material for tracing failures in any particular type and for comparisons with other types to be drawn with a view to future commitments.

142. We are not blind to the fact that this record must indicate to headquarters how the different squadrons compare in performing their duties; whether, for instance, they are active enough whilst not being too active to the detriment of the pilots and machines.

143. It is suggested that this leads the superior officers to send more machines to do a piece of work than are necessary, or to send them up on pretended errands. It may be so, although we have no evidence of it. There are always to be found persons who hope to rise by making an impression of zeal and keenness. There are also some persons in authority who are so impressed. We have no evidence that the General Officer Commanding the Royal Flying Corps in France is among their number. Even if he is, the record is so obviously valuable, and indeed necessary, that the risk of it being abused must be run. We should suppose that any instance of real abuse is fairly easy to detect.

(n).—No Machines went up on the Occasion of the Raid at Dover by a German Seaplane which was over Dover on or about January 31st, 1916.

144. It appears that Dover is a Naval War Station, and that the Royal Flying Corps merely has a training and mobilising ground there. On the date in question it happened that General Henderson was inspecting there. He had just gone into the mess-room when he heard the anti-aircraft guns firing. The only portion of the Royal Flying Corps at Dover at the time was a half-completed squadron ready to go abroad. Directly the guns were heard, the pilot on duty ascended in pursuit of the German seaplane, and was immediately followed by two Naval machines, and these again by another Army machine. It appears that the machines went up in the opposite direction to Dover, so were not seen by the inhabitants of that town. The day was rather misty and the German seaplane 8,000 feet up, so that the British machines were unable to catch it. Another allegation was that the anti-aircraft guns fired at the British aeroplanes, and there is evidence which points to some rounds having been fired at one of the Naval machines.

[Which is as stated by critics of mis-organisation of Home Defence of the period.]

(o).—The Sending Home of 74 Pilots for Further Training the Day after Mr. Pemberton-Billing’s Election to the House of Commons.

145. This charge was not made by Mr. Pemberton-Billing. There is no foundation for it, and certainly none for the implication that the return of Mr. Pemberton-Billing was the cause. The suggestion probably originated in the fact that observers who wish to become pilots are from time to time sent home in batches, as also are pilots when promoted or when sent home to form new squadrons.

146. The charge was made in perfectly good faith, and affords an excellent illustration of how a witness who retails information of the “gossip” order may be misled, and, incidentally, of the class of unfounded sinister suggestions which we found to be abroad.

147. Of the accidents and misadventures under letter (p), we only deal in the report with the first three. The remainder, while regrettable, as are all losses of British airmen, are instances of the kind of mishap at present inseparable from flying, and raise no question of principle.

[It is deeply to be regretted that the other cases were not dealt with. There is much to be said about some of them.]

(p).—The Mishap to Machines on January 31st last.

148. This case was presented to the Committee in the following words:—

“I think, if the Committee will inquire into the actual condition of the actual occurrence on the night of January 31st, they will discover that 14 or 15 machines were sent up, that approximately 75 per cent. of the pilots were killed and that

no useful purpose, as far as I can see from the Military standpoint, was either accomplished or attempted.”

149. The facts of the case as brought out in evidence are that on that particular night a Zeppelin raid was reported as threatening London, and orders were issued to nine stations as follows:—
“If weather conditions permit you will send up the first patrol at 7.35 p.m. The second patrol will go up at 9 p.m.”

150. In view of the often repeated allegation that peremptory orders are issued from the Royal Flying Corps Headquarters to send pilots up without regard to the local weather conditions, we call attention to the form of this order which is typical.

151. There was in most places a ground mist, and had no attempt to ascend been made no fault could have been found; but the zealous and brave airmen, taking great risks, ascended into the air and, owing to the thickness of the weather, met with many accidents on attempting to land, the total casualties being that four pilots were injured, two only comparatively slightly, whilst two eventually succumbed to their injuries. Of the machines, seven were damaged and four hopelessly smashed.

152. Serious as the results were, they fall far short of the allegation that 75 per cent. of the pilots were killed. In its Interim Report, the Committee has already drawn attention to the self-sacrificing devotion and bravery of the pilots; and, as it appears that all the pilots were experienced in night-flying, it only remains for us in this report to record our opinion that no blame can attach to the Directorate of the Royal Flying Corps.

[Perhaps not. But one could have wished for more foresight.]

(p).—The De Havilland Squadron Case.

153. This case occurred on March 25th, 1916. It concerns a squadron of new scout machines—single-seated and fast—which was urgently required at the front. The machines had only just been completed, except three which had been stationed at Gosport (where the 29th Squadron, the one in question, was being trained) for a month or six weeks for training purposes. Altogether 12 machines were required in France, two of which were to go from Hendon and 10 from Gosport. The machines were being delivered at Gosport during the days immediately preceding the 25th, the last arriving on March 24th.

154. It is said that the pilots were refused leave to try their machines, but there is evidence to show that all pilots had some practice in them, though some of them had too little.

155. The 10 from Gosport got into a snowstorm and six had to make forced landings between Gosport and Dover. Fresh machines were procured and more accidents occurred, with the result that, in order to deliver 12 serviceable machines in France, 26 or 27 were consumed, of which four were completely smashed and the remainder eventually repaired. Mercifully only two pilots were hurt and they only slightly. Apparently two of the 10 pilots from Gosport were considered very experienced. The two from Hendon reached France in safety, but did not encounter the snowstorm, but whether these two pilots had been overseas before is not quite clear. An attack of measles had prevented the presence of the mechanics at Gosport for some days previously, and this may partly account for the disastrous results; but Brigadier-General W. G. H. Salmond, R.A., who reported on the affair, considered the snowstorm was the main cause of trouble. It is noticeable that even the experienced Gosport pilots also came to grief.

156. It appears that of the 10 machines which were dispatched from Gosport—six of which made forced landings between Gosport and Dover—six had no compasses; but whether the six which were forced to land were all those without compasses there is no clear evidence. We were informed that, as the demand for the Squadron was urgent, the dispatching officer felt himself justified in sending off these six machines, arranging for them to pick up their compasses at Folkestone, which they eventually did.

157. It has been urged before the Committee that none of the accidents resulted from the absence of compasses. This view, however, the Committee is not prepared to accept as, without evidence to the contrary, it is quite possible that the absence of compasses materially contributed to bringing some of the machines to grief.

158. It appears also to the Committee that the pilots had not sufficient experience to compete with such a snowstorm in machines which were more or less new to them; and that, in ordering the squadron to proceed to France without giving more time for getting thoroughly efficient in flying a new and by no means easy machine, considerable risk was taken by the Royal Flying Corps Directorate. But whether the state of affairs in France at the time was such as to necessitate so great a risk being taken by the Directorate—and, in the case of the compassless machines, by the dispatching officer at Gosport—is beyond the knowledge of this Committee.

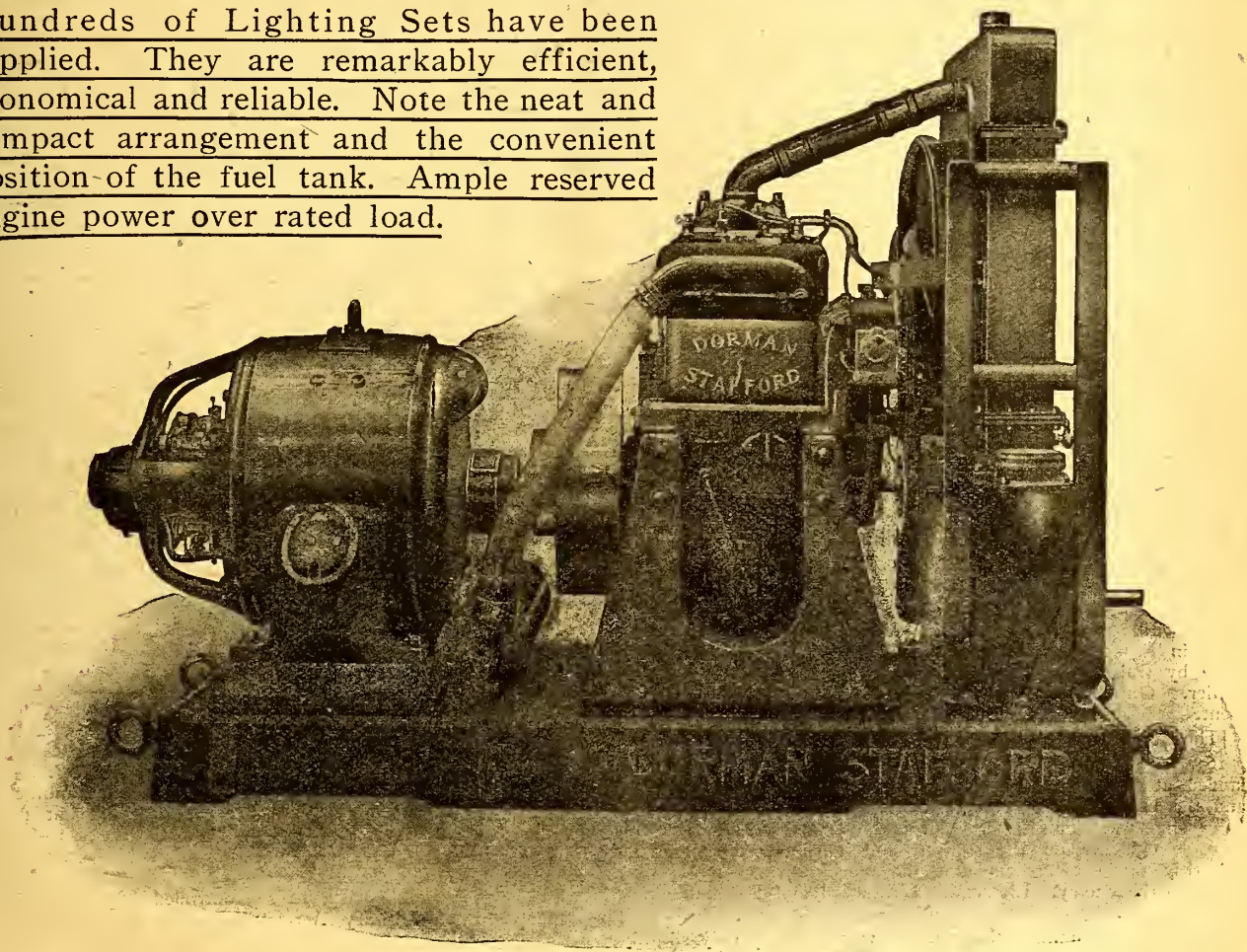
159. The point which impresses us most in this De Havilland Squadron case is the absence of a formal inquiry. We are strongly of opinion that, upon the happening of a disaster of this magnitude, involving great loss of Government property and of (ex hypothesi) urgently needed machines, a court of inquiry should have been at once assembled and a most search-

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

ing investigation made. It is true there was no actual loss of life, but that does not alter or modify our opinion. The incident was, we think, treated far too lightly.

[One believes that an inquiry of some sort was held.]

(p) 3.—**The Landing of an F.E.2d. Machine with a Rolls-Royce Engine at Lille.**

160. This incident happened on May 31st last. It was desired to send to France an F.E.2d. machine fitted with a 250 h.p. Rolls-Royce engine, a new combination of which the highest expectations were entertained. The machine was at Farnborough. There are stationed at Farnborough ferry pilots whose duty it is to fly machines to St. Omer in France and to return. It was intended to send one of these pilots across with this machine. The particular pilot selected was required for some other duty on the day in question, but other ferry pilots were available. As a fact, no ferry pilot was sent, but, instead, Lieutenant Littlewood, who was considered very efficient, but had never flown to France before, flew this machine across. How he came to be chosen for the duty is not clear.

161. The officer responsible for detailing the pilot for the purpose tells us that he received a telephone message from the War Office to say Lieutenant Littlewood was coming down to take the machine over. This officer informed us that he told the person speaking to him on the telephone that Lieutenant Littlewood had done no flying on an F.E.2d. machine, but had done a little on an F.E.2b. The reply was that he had been well reported on and was considered capable. Lieutenant Littlewood was intended to remain in France. The witness was pressed for the name of the person who spoke to him on the telephone, but he had forgotten it. This was a somewhat singular lapse of memory, seeing that, although he did not give evidence before us until August 1st, the incident was well known the day after it happened, and, one would have thought, it would have made a considerable impression on the minds of the persons concerned in sending Lieutenant Littlewood over. It is to be presumed that the somewhat mysterious gentleman who was at the War Office end of the telephone knows who he was and why he gave the order. It is unlikely that both gentlemen should suffer from so singular a lapse of memory about an incident of such importance. It is the more unlikely as the Rolls-Royce engine was only the second of its kind sent over. The speaker from the War Office was not called, nor did he volunteer to come forward. He has preferred to remain a voice.

[Perhaps he is in Germany, as a prisoner; one never knows.]

162. Lieutenant Littlewood went, and took with him a staff officer who had never, so far as we know, been in a machine before. This gentleman was said to have an important engagement in France. He was over here on leave and if he had gone by train and boat he would have needed to start a day earlier. On the other hand, he would have kept his appointment.

[The Committee is to be congratulated on its sense of humour.]

163. Lieutenant Littlewood mistook Lille for St. Omer and landed at Lille. In the course of his descent he was fired at and the machine was brought down by anti-aircraft guns and badly smashed. This latter point is important, as we have undeniable evidence on the subject, and it refutes an allegation explicitly made before us that the machine was handed over intact to the enemy. Lieutenant Littlewood and the staff officer are prisoners.

[As they were unhurt, the machine was probably only slightly damaged.]

164. The incident in itself is not at all worth relating at such length, but it discloses a system, or rather want of system, which we much deprecate. We were told these telephonic messages are quite common and that no record is kept of them.

165. We are of opinion that whenever the duty of detailing a pilot to fly a machine abroad is taken out of the hands of the officer primarily responsible, or indeed when any important order is given by telephone, a record should be entered in a book kept for the purpose, giving full particulars of the order received, and certainly the name of the person giving the order. Without such a record it is impossible to fix responsibility.

166. Lieutenant Littlewood may have been a suitable pilot, but the staff officer ought not to have been sent with him. Some criticism was made upon the map supplied, but we find no fault in that respect.

167

168. We have stated our conclusions upon the charges submitted to us when dealing with each particular charge, and need not repeat them.

169. We are asked to make such recommendations as we consider necessary. This we now proceed to do.

RECOMMENDATIONS.

I.—Our first recommendation, and that to which we attach greatest importance, is that the equipment of the Royal Flying Corps should be entirely separated from the executive command. General Henderson's position as Commander of the Royal Flying Corps, responsible for it as a fighting arm and at the same time responsible as Director-General of Military Aeronautics for its equipment, is an impossible position for any man to fill now that the Royal Flying Corps has grown to its present dimensions, and especially in view of its probable further growth. There seems no reason why this change should not be made at once. There are officers on the Directorate of Military Aeronautics who have now sufficient experience to take over equipment and deal with it independently.

Whether there should some day be a united air service combining the Royal Flying Corps and the Royal Naval Air Service we are not in a position to say. However that may be, we see no reason against having one Equipment Department charged with the equipment of both the Army and Navy Flying Services. There would no doubt be inter-Service jealousy to contend with, but that should not be allowed to stop a much needed reform.

There could hardly be a stronger illustration of the need for a united equipment service than the fact that, at the beginning of the war, the manufacturing resources open to the two Services were divided between them without any possible knowledge of how the division would work out in practice, a division which has in fact given rise to many difficulties.

We have seen how separate Equipment Departments for each Service led to friction in France, and how the friction ceased when one officer was sent there for both Services.

A joint Equipment Department would, in our view, tend to abolish competition and friction between the Services, and make for increased efficiency.

II.—We think the continued existence of the R.A.F. is essential. It should not, in our opinion, become a manufacturing establishment, but should confine its activities, as at present, to the five subjects stated in our Report, namely:—(1) Trial and experiment; (2) Research; (3) Preparation of drawings; (4) Repairs; (5) Manufacture of spares.

The R.A.F. would need to be controlled by the Equipment Department of Military Aeronautics, but if this Department was entirely divorced from the Royal Flying Corps, much of the Trade jealousy of the R.A.F. would, we hope, disappear.

THE "AEROPLANE'S" SPECIAL NAVAL AND MILITARY ISSUES, 1917.

On January 3rd and 10th. "The Aeroplane" will produce its Special Naval and Military Issues. It has been decided to publish them both in January this year, so as to bring the complete record of the year's work into one volume, instead of splitting it between two volumes as occurred last year. These issues will contain a record of the aeronautical history of 1916, each month's events being divided into sections showing the Naval, Military, Foreign and Home affairs of the period. The Naval issue will contain an appreciation of the good work done by the active section of the R.N.A.S., a list of honours and special promotions won by the R.N.A.S., and a supplement on art paper illustrating "Seaplanes of 1916." The Military Issue will review the great activities and developments of the R.F.C., there will be a list of R.F.C. honours and promotions, and a supplement illustrating "Aeroplanes of 1916." In these issues there will also appear tables showing the progress of the various aeroplane records for speed, height, distance, and duration, from the earliest days of flying up to the outbreak of war. The usual features of the paper will also appear in their usual places, as well as some special articles.

Owing to the limitations of the supply of paper these Special Issues cannot be sent out broadcast to newsagents, and judging by the success of the recent Airship Issue and the previous Naval and Military Issues there will be a very great demand for them. It will, therefore, be advisable for readers to order them beforehand from their bookstalls, so as to avoid disappointment. Despite the greatly increased size of these Issues the price will remain as usual.—C.G.G.

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III.—We recommend that, during the war, and until our ideal of interchangeable observers and pilots is reached, observers should receive promotion without having to become pilots, and that a corps of observers be formed with a regular establishment graded for promotion among themselves.

IV.—There are one or two minor recommendations which obviously arise out of our report, such as the tightening of discipline in the upkeep of school machines. These we do not think it necessary to repeat.

170. We have finished the duty we were asked to perform. The task of fault-finding, always unpleasant, became more and more distasteful to us as we proceeded with our inquiries. When we look back to the Royal Flying Corps at the outbreak of war setting out with its 100 or so pilots, its 66 aeroplanes for the front, and with its 20 serviceable ones at home for training, when we remember that none of its engines were of British design, and it was dependent upon the goodwill of our Allies the French for much of its material, and when we see it now increased out of all recognition in numbers and efficiency of its aeroplanes, with their vastly improved engines, its ability to rely upon British manufacturers to supply its needs, its training schools, its aerodromes, its equipment, its pilots and observers, its army of mechanics, it seems as though the Royal Flying Corps is a new creation.

[For which the nation may thank Major-General Trenchard, Brigadier-General Brancker, Brigadier-General Salmond, and Colonel Charlton.]

171. Our admiration is increased when we remember that all the work necessary to bring it into its present state of efficiency has been done while bearing the heavy burdens of rendering such services as the Army required of it in the field and on the fronts.

172. A microscopic examination has disclosed some mistakes,

AIRCRAFT IN THE LORDS.

On December 21st, their lordships went into Committee on the New Ministries and Secretaries Bill, the Earl of Donoughmore in the chair.

On Clause 7, which provides for the establishment of an Air Board,

The **Earl of Selborne** asked what was the meaning of the words in the clause to the effect that the President of the Board should act on the advice of the other members.

The **Lord Chancellor** said the effect of the words was that the President must take the advice of the other members of the Board before he acted.

The **Earl of Selborne**: Must he follow the advice of the other members?

The **Lord Chancellor**: It does not say so.

Lord Burnham: Could he be overruled?

The **Lord Chancellor**: I should say not. I am speaking off-hand, as my attention has not been called to the question before.

Lord Buckmaster said the words must have been inserted with an object.

The **Lord Chancellor** said the words were inserted as the result of a compromise. It was intended that the President should be compelled to take the advice of the members, but he was not necessarily bound to follow that advice.

The clause was agreed to.

[**Lord Curzon**, it may be remembered, has a reputation for acting on his own initiative, and he has never shown any fear of taking the responsibility for his own acts.—Ed.]

AIRCRAFT IN THE COMMONS.

On Dec. 19th, **Sir George Cave** moved a new clause for the establishment of an Air Board consisting of a President, who will hold office during His Majesty's pleasure, and of other members appointed in such manner as His Majesty may by Order in Council direct. The President is to act with the advice of the other members, and will be deemed to be a Minister and the Air Board a Ministry. **Sir G. Cave** reminded the Committee that the Air Board had in effect existed for some months, and said that it was formed by a Cabinet minute or some procedure of that kind, and represented the War Office, the Admiralty, and the Ministry of Munitions. It had a President who had considerable power as a Cabinet Minister, but it had no statutory existence. The object of the new clause was to regularise this position.

* * *

...**Mr. Herbert Samuel** (Yorkshire, Cleveland) testified to the great interest that was taken in the Board and its functions, and asked whether, as constituted under the clause, it would in fact be the same as the old Board. He also wished to know whether **Lord Curzon** was likely to continue to act as President.

as we think. How could it be otherwise? General Henderson has told us that the responsibility is his for such shortcomings as there are. We ascribe them to the difficult position in which he was placed.

173. The gratitude and thanks which are his due for a great work devotedly undertaken and well done he will, we know, be glad to share with the officers and men who have served under him, whether as Commander of the Royal Flying Corps or as Director-General of Military Aeronautics.

174. We desire to put on record our appreciation of the services of our secretary, **Mr. D. Cotes-Preedy**—services rendered gratuitously and at the expense of some loss to him in his practice, which he put aside when his duties as secretary prevented his fulfilling his other engagements.

We are, Sir, your obedient Servants,

CLEMENT M. BAILHACHE,
Chairman.

H. L. SMITH-DORRIEN,
General.

CHARLES A. PARSONS.
J. H. BALFOUR BROWNE.
J. G. BUTCHER.
EDWARD SHORTT.
CHARLES BRIGHT.

D. COTES-PREEDY, Secretary.

November 17th, 1916.

TO THE SECRETARY,
WAR OFFICE.

[The report is, on the whole, a highly satisfactory document, and contains far more criticism than any of those who agitated publicly in the early part of the year ever expected. Those of us who were responsible for the calling together of the Committee can now feel that we have, at any rate, been publicly justified in our actions at that time. The reforms recommended by the Committee, which coincide closely with the reforms recommended by the agitators, have practically all been carried out, and, though nothing human can be perfect, there is little enough fault to be found with R.F.C. administration to-day, except in the production of aeroplanes.—C. G. G.]

Sir G. Cave, in reply, while not saying that the noble earl would not continue to be at the head of the Board, guarded himself against suggesting that he would continue as head.

The clause was read a second time and added to the Bill, as was the following clause:—The Air Board shall, in relation to aircraft, have such powers and duties of any Government Department or authority, whether conferred by statute or otherwise, as His Majesty may, by Order in Council, transfer to the Board, or authorise the Board to exercise or perform concurrently with or in consultation with the Government Department or authority concerned.

The Bill then passed through Committee.

* * *

On Dec. 20th **Mr. Ashley** asked for more information about the constitution of the Air Ministry. He urged that the Air Board should include a representative of the Ministry of Munitions and also of the International Buying Commission. The Bill provided that the Air Ministry should come to an end twelve months after the war. He thought that was a great mistake, in view of the growing military importance of aviation.

Sir G. Cave replied that the composition and powers of the Air Board were not yet finally settled, but he had reason to believe that the Ministry of Munitions would be represented upon it. In the course of the year after the war there would be ample time to consider whether the Board should be continued as a permanent institution.

* * *

Mr. Macpherson, Under-Secretary to the War Office, stated in reply to **Dr. Lynch** in the Commons on Dec. 21st, that the London anti-aircraft defences had been provided with an efficient Zeppelin range-finder. It had been used effectively, but its use did not in itself guarantee that the targets would be hit.

THE PARLIAMENTARY ART COMMITTEE.

The bombing of buildings and destruction of works of art in Italy have been formerly brought to the attention of the Parliamentary Art Committee by the Da Vinci Society. The Committee met at the House of Commons on Dec. 20th, with **Lord Plymouth** in the chair, and expressed their abhorrence of such acts by belligerent forces.

[One would have imagined that the members of the Parliamentary Art Committee could have found work of greater national importance.

The R.N.A.S. and the R.F.C. would naturally resent any attempt at interference with their air raids on the grounds that Belgian and German *objets d'art* might be endangered.—Ed.]

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

NAVAL AND MILITARY AERONAUTICS.

From the "London Gazette," Dec. 19th, 1916.

WAR OFFICE, Dec. 19th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flying Officers.—Temp. Capt. E. F. Elderton, Ches. R., and to be transfd. to Gen. List; Lt. W. J. Cairnes, Leins. R., Spec. Res., and to be secd., Nov. 6th. Capt. E. W. Broadberry, Essex R., T.F., Nov. 8th. Sec. Lt. A. E. L. Skinner, Norfolk Yeo., T.F., Nov. 9th. Temp. Capt. K. R. Paterson, R. W. Fus., and to be transfd. to Gen. List; Sec. Lt. L. W. Heathcote, Australian Flying Corps, Nov. 14th. Sec. Lt. (temp. Lt.) T. F. Preston, Norfolk Yeo., T.F., Nov. 22nd. Lt. H. C. Burdett, T.F. Res.; Sec. Lt. H. J. Hamilton, D. of Corn. L.I., from a Flying Officer (Observer), with seny. from Aug. 30th. Sec. Lt. G. F. Blackburn, Spec. Res., Nov. 27th. Temp. Sec. Lt. C. J. Dickinson, R. W. Kent R., and to be transfd. to Gen. List; Sec. Lt. G. W. Dowding, Spec. Res.; temp. Sec. Lt. E. H. M. Fetch, Gen. List; Sec. Lt. (temp. Lt.) E. A. Stewardson, R. W. Surr. R., T.F.; Sec. Lt. G. R. Beck, Lond. R., T.F.; temp. Sec. Lt. (on prob.) H. L. Barlow, R.E., Nov. 28th. Lt. F. L. Baker, 67th Canadian Inf. Bn.; temp. Sec. Lt. P. S. Williams, Gen. List, Nov. 30th.

Equipment Officers, 2nd Cl.—From the 3rd Cl., Dec. 1st.—Sec. Lt. (temp. Lt.) W. R. Bruce-Clarke, Lond. R., T.F., and to retain his temp. rank whilst so empld.; temp. Lt. H. N. Nowell, Gen. List; from the 3rd Cl., and to be temp. Lts. whilst so empld.:—Sec. Lt. G. Jacques, Spec. Res.; Sec. Lt. E. W. Havers, Spec. Res.; temp. Sec. Lt. J. D. Drysdale, Gen. List; Sec. Lt. F. C. Rowe, Spec. Res.; Sec. Lt. J. MacD. Patten, Spec. Res.; temp. Sec. Lt. A. K. Hall, Gen. List; Sec. Lt. J. E. R. Avery, Spec. Res.

3rd Cl.—Sec. Lt. (on prob.) J. T. Rossiter, Spec. Res., Sept. 1st. Sec. Lt. (on prob.) E. T. Driver, Gen. List, Oct. 2nd. Temp. Sec. Lt. L. Legge, Gen. List, Nov. 11th.

MEMORANDA.—To be temp. Sec. Lts. (on prob.) for duty with R.F.C.:—Cdt. J. G. Harriott, from an Officer Cdt. Bn., Nov. 22nd. Sgt. J. A. Atkinson, from H.A.C., T.F.; Pte. A. D. Birkhead, from L'pool R., T.F.; Flt. Sgt. E. A. Tottle, from Hampshire Aircraft Parks, T.F., Dec. 8th.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lts. (on prob.) are confirmed in their rank:—A. L. Constable, B. Gaskin, F. I. Fleming, H. T. Lydford, A. C. Reeves, W. L. Shaw, A. Graham, J. F. B. Smith, J. C. Rimer, A. Burgess, R. A. W. Collet, J. Farquharson, W. T. Davis, J. Page, A. C. Day, F. J. E. Stafford, R. G. Robson, F. C. Smith, H. Simson, V. T. Norminton, G. F. Blackburn, W. F. Dobson, E. Armistage, H. Blofeld, G. W. Dowding. To be Sec. Lts. (on prob.):—C. R. F. Wickenden, J. W. G. Boyd, Nov. 21st. C. L. Hardy, Dec. 1st. P. P. Nicholl, D. H. Blaikie, J. C. F. Williams, H. L. Dawson, C. G. Sweet, M. Thompson, H. C. Perks, V. S. Holbrook, R. Knott, P. Ogden, C. E. Fairburn, Dec. 8th.

The notification in "Gazette" of Nov. 11th of the appt. of L. A. Owen to be Sec. Lt. (on prob.) is cancelled.

TERRITORIAL FORCE.—R.F.C.—Flt. Sgt. C. Fairbrother to be Sec. Lt.; 2nd Cl. Air Mechanic N. F. Stockbridge to be Sec. Lt., Dec. 18th.

R.G.A.—Sec. Lt. C. J. Pullen is secd. for duty with the R.F.C., Nov. 30th.

R.E.—Sec. Lt. R. J. Anderson is secd. for duty with the R.F.C., Dec. 6th.

* * *

From the "London Gazette" Supplement, Dec. 20th, 1916.

WAR OFFICE, Dec. 20th.

REGULAR FORCES.—The following Wt. and N.C.Os. to be Sec. Lts. for service in the Field:—

MEMORANDA.—For duty with R.F.C.—Act. Sgt.-Maj. J. D. Payne, from R.F.C., Oct. 30th. Cpl. B. Ankers, from R.F.C., Nov. 5th.

Wt., N.C.Os. and men to be temp. Sec. Lts. (on prob.):—

For duty with R.F.C.—Cpl. C. S. Goodfellow, from R.E., Oct. 29th. Act. Sgt. P. S. Taylor, from A.S.C.; Pte. F. Tapping, from Can. A.S., Nov. 14th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Flt. Comdrs.—From Flying Officers, and to be temp. Capt. while so empld.:—Sec. Lt. (temp. Lt.) R. L. C. Roberts, Hamps. R., Dec. 4th. Sec. Lt. W. H. Tolhurst, Spec. Res.; Sec. Lt. (temp. Lt.) B. P. G. Hunt, Shropshire Yeo., T.F.; Sec. Lt. H. A. Wood, Spec. Res., Dec. 5th.

Flying Officers.—Lt. (temp. Capt.) H. F. Game, R. War. R., Spec. Res., to be secd., and to relinquish his temp. rank; Sec. Lt. (temp. Lt.) C. S. Vane-Tempest, Durh. L.I., T.F.; temp. Lt. A. N. Solly, Gen. List, from a Flying Officer (Observer), with seny. from July 27th. Sec. Lt. R. H. Dryden, Northumbrian Brig., R.F.A., T.F.; temp. Sec. Lt. A. Binnie, R.A., and to be transfd. to Gen. List; Sec. Lt. H. Jimson, Spec. Res., Nov. 27th. Sec. Lt. T. M. Southorn, Lowland Brig., R.F.A., T.F.; temp. Sec. Lt. A. A. Harcourt-Vernon, E. Supr. R., and to be transfd. to Gen. List, Nov. 28th. Temp. Sec. Lt. C. O. B. Beale, Gen.

List; temp. Sec. Lt. (on prob.) W. G. Holbrow, Gen. List; Sec. Lt. H. Blofeld, Spec. Res.; temp. Sec. Lt. J. MacGeorge, Gen. List, Nov. 29th. Sec. Lt. C. Eales, Devon R., T.F.; temp. Sec. Lt. C. R. H. Jackson, Gen. List; temp. Sec. Lt. W. Selwyn, Gen. List; Lt. A. T. Eden-Eadon, N. Staff. R., Spec. Res., and to remain secd.; temp. Sec. Lt. G. C. Holman, A.S.C., and to be transfd. to Gen. List; Sec. Lt. C. J. Pullen, E. Anglian (Essex), R.G.A., T.F.; temp. Sec. Lt. (on prob.) C. J. Hewins, R.E., Nov. 30th.

Adjut.—Capt. J. D. Strong, 90th Punjabis, Ind. Army, Nov. 8th. Depot Comdr.—Capt. (temp. Major) G. B. Hynes, R.A., from a Park Comdr., and to be temp. Lt.-Col. whilst so empld., Nov. 1st.

Park Comdrs.—From Equipment Officers, 1st Cl., and to be temp. Maj. whilst so empld.:—Capt. L. F. R. Fell, Spec. Res., Nov. 1st. Capt. R. Hall, R. W. Fus., and to be secd., Dec. 6th.

Equipment Officers, 1st Cl.—From the 3rd Cl., and to be temp. Capt. whilst so empld.:—Temp. Lt. E. M. Bettington, Gen. List; Sec. Lt. W. D. L. Jupp, Spec. Res., Nov. 1st. Temp. Sec. Lt. (temp. Lt.) P. B. Hunter, A.S.C.; Sec. Lt. C. G. Smith, Spec. Res., Dec. 1st.

Equipment Officers, 2nd Cl.—From the 3rd Cl., and to be temp. Lts. whilst so empld.:—Sec. Lt. T. Bullen, Som. L.I., Nov. 1st. Sec. Lt. H. R. Vagg, Som. L.I.; Sec. Lt. S. G. Frost, Spec. Res.; temp. Sec. Lt. A. S. Ellerton, Gen. List; Sec. Lt. L. H. B. Cosway, Spec. Res.; Sec. Lt. A. R. Thomas, Spec. Res.; temp. Sec. Lt. A. S. Morris, Gen. List, Dec. 1st.

Wing Instrs. in Gunnery.—(Graded as Flt. Comdrs.).—From Flying Officers.—Lt. (temp. Capt.) A. G. H. Carr, York and Lanc. R., T.F., and to retain his temp. rank whilst so empld.; Capt. R. Bell-Irving, 29th Canadian Inf. Bn.; temp. Capt. H. E. Dixon, Gen. List. From Flying Officers, and to be temp. Capt. whilst so empld.:—Temp. Lt. S. H. Bird, Gen. List; Sec. Lt. (temp. Lt.) W. G. B. McKechnie, R. Sc. Fus., and to be secd.; temp. Sec. Lt. G. Ross-Soden, Gen. List; temp. Lt. S. E. Adams, Gen. List; temp. Sec. Lt. W. H. Miles, Gen. List; Sec. Lt. R. G. Heyn, Spec. Res., Sept. 21st. Sec. Lt. M. R. N. Jennings, Spec. Res., Oct. 4th. Capt. M. G. B. Copeman, Leic. R., a Flt. Comdr., Oct. 27th.

MEMORANDA.—Sec. Lts. (on prob.) Spec. Res., to be temp. Lt. whilst serving with R.F.C.:—C. H. Knight, Dorset R.; N. Brearley, M.C., L'pool R.; D. G. A. Allen, Durh. L.I., Nov. 1st. (Substituted for the notification in "Gazette" of Dec. 16th.)

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—Sec. Lt. (on prob.) J. H. G. Wilson resigns his commn., Dec. 21st.

TERRITORIAL FORCE.—YEOMANRY.—Sec. Lt. L. S. M. Page is secd. for duty with the R.F.C., Nov. 5th. Sec. Lt. (temp. Lt.) T. F. Preston is secd. for duty with the R.F.C., Nov. 22nd.

R.F.A.—Sec. Lt. (temp. Lt.) J. A. Middleton is secd. for duty with the R.F.C., Nov. 12th. Sec. Lt. T. M. Southorn is secd. for duty with the R.F.C., Nov. 28th. Sec. Lt. R. H. Dryden is secd. for duty with the R.F.C., Nov. 27th.

INFANTRY.—DEVON R.—Sec. Lt. C. Eales is secd. for duty with the R.F.C., Nov. 30th.

R. WELSH FUS.—Sec. Lt. T. B. Morris is secd. for duty with the R.F.C., Nov. 12th.

DURH. L.I.—Sec. Lt. (temp. Lt.) C. S. Vane-Tempest is secd. for duty with the R.F.C., Nov. 27th.

LOND. R.—Sec. Lt. (temp. Lt.) W. Smith is secd. for duty with the R.F.C., Nov. 12th.

TERRITORIAL FORCE RESERVE.—GENERAL LIST.—Lt. H. C. Burdett to be secd. for duty with the R.F.C., Nov. 22nd.

* * *

From the "London Gazette" Supplement, Dec. 21st, 1916.

WAR OFFICE, Dec. 21st, 1916.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—Wing Comdrs.—From Sqdn. Comdrs., and to be temp. Lt.-Cols. whilst so empld.:—Capt. (temp. Maj.) the Hon. J. D. Boyle, Rif. Bde.; Capt. (temp. Maj.) P. K. Wise, R. War. R.; Capt. (temp. Maj.) W. F. MacNeece, R.W. Kent R.; temp. Maj. F. H. Cleaver, Gen. List; temp. Maj. the Hon. A. S. Byng, Gen. List, Dec. 5th.

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so empld.:—Temp. Lt. J. M. E. Shepherd, Gen. List; temp. Lt. K. F. Balmain, Gen. List, Dec. 6th.

Flying Officers.—Temp. Sec. Lt. F. H. E. Kolligs, N. Lan. R., and to be transfd. to Gen. List; Sec. Lt. A. E. Townsend, Dur. L.I., T.F.; temp. Sec. Lt. B. Mews, Gen. List; temp. Sec. Lt. W. T. Price, attd. R. War. R., Nov. 28th. Sec. Lt. R. G. Robson, Spec. Res.; Sec. Lt. F. C. Smith, Spec. Res.; temp. Sec. Lt. J. H. Hayward, Gen. List; temp. Sec. Lt. F. P. Holliday, Gen. List; from a Flying Officer (Observer), with seny. from March 10th; Sec. Lt. J. L. Bicknell, Glouc. R., T.F.; temp. Sec. Lt. A. J. Lucas, Gen. List; temp. Sec. Lt. C. F. Jex, Gen. List; Sec. Lt. F. J. E. Stafford, Spec. Res., Nov. 29th.

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Equipment Officers, 2nd Cl.—From the 3rd Cl.—Temp. Lt. W. B. Cushion, Gen. List. And to be temp. Lts. whilst so employed:—Sec. Lts. (S.R.):—G. A. Crane, C. G. Jones, L. A. Clayton, J. E. Rendle, Dec. 5th. 3rd Cl. Temp. Sec. Lt. (on prob.) S. R. Winkworth, Gen. List. Sec. Lt. (on prob.) H. Wilson, S.R.; Sec. Lt. E. G. Webber, Gen. List; Sec. Lt. F. R. Wilkins, Gen. List; temp. Sec. Lt. (on prob.) G. H. Creighton, R. Ir. Fus., and to be transferred to Gen. List; temp. Sec. Lt. (on prob.) F. J. Cunningham, Gen. List; Sec. Lt. (on prob.) C. E. Bagram, S.R.; temp. Sec. Lt. (on prob.) A. W. Barnett, Gen. List; temp. Sec. Lt. (on prob.) S. H. Child, Gen. List; temp. Sec. Lt. (on prob.) J. B. Crabb, Gen. List; Sec. Lt. L. H. Clifford, S.R.; Sec. Lt. (on prob.) R. J. Anderson, Lowland Divl. Engrs., R.E., T.F.; temp. Sec. Lt. (on prob.) J. H. A. Bryne, Gen. List; temp. Sec. Lt. C. H. Blakeway, Gen. List; Sec. Lt. (on prob.) E. Brown, S.R.; temp. Sec. Lt. (on prob.) B. O. Butler, Gen. List; temp. Sec. Lt. (on prob.) H. W. Armstrong, Gen. List, Dec. 6th.

SCHS. OF MIL. AERONAUTICS.—Chief Instr.—(Graded as a Park Comdr.)—Temp. Maj. A. E. G. MacCallum, Gen. List, from an Asst. Comdt. (R.F.C. Staff Officer, 2nd Cl.), vice Capt. C. M. Crowe, S.R. (Dec. 14th).

MEMORANDA.—Cadets to be temp. Sec. Lts. for duty with R.F.C.—C. F. Jex, J. H. Hayward, Aug. 14th.

To be temp. Lts. (on prob.)—Pts. R. J. Paton, from A.S.C., for duty with R.F.C., Dec. 8th. F. Bretherton, Dec. 12th.

Actg. Sgt. E. W. Lawrence to be Sec. Lt., for duty with R.F.C., Dec. 22nd.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—The following Sec. Lts. (on prob.) resign their commissions:—S. S. Jefferies, H. Fuller-Clark, Dec. 22nd. The following Sec. Lts. (on prob.) relinquish their commissions on account of ill-health:—R. A. B. Hall, A. P. Boney, Dec. 22nd. Sec. Lt. (on prob.) L. G. Gifford is confined in his rank. To be Sec. Lts. (on prob.):—J. H. Cotton, Nov. 28th. A. G. Smith, Dec. 1st. Gr. R. Shibley, C. E. Rushworth, A. E. McKeever, Dec. 5th. H. Smith, Dec. 8th.

REGULAR FORCES.—INFANTRY.—R. SUSS. R.—Temp. Sec. Lt. H. V. James, from Gen. List, R.F.C., to be temp. Sec. Lt. (attd.), Dec. 22nd, seny. from July 7th

A special supplement to the "London Gazette" dated Dec. 21st contained the following:—

The King has been graciously pleased to award the Military Medal for bravery in the Field to the following Non-Commissioned Officers and Men:—

7258 Cpl. (Actg. Sgt.) H. Brown, R.F.C.
7748 1st Cl. Air Mech. W. H. Dowling, R.F.C.
10591 Cpl. C. T. Galpin, R.F.C.
4917 1st Cl. Air Mech. F. S. Mackrell, R.F.C.
8847 2nd Cl. Air Mech. J. C. Middleton, R.F.C.
8192 2nd Cl. Air Mech. A. E. Pitcher, R.F.C.
6773 1st Cl. Air Mech. A. V. Scholes, R.F.C.
7754 2nd Cl. Air Mech. H. T. Tabor, R.F.C.
8267 2nd Cl. Air Mech. S. H. G. Triggs, R.F.C.
7255 2nd Cl. Air Mech. L. G. Venn, R.F.C.
8237 2nd Cl. Air Mech. G. L. G. Watson, R.F.C.
8191 2nd Cl. Air Mech. L. Williams, R.F.C.

[Owing to THE AEROPLANE being compelled to go to press before Christmas, further "Gazettes" must be held over till next week.—Ed.]

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Dec. 20th.

The following Officer had the honour of being received by the King this morning, when His Majesty invested him with the Insignia of Companion of the Order into which he has been admitted.

THE DISTINGUISHED SERVICE ORDER.—Sec. Lt. IAN PYOTT, R.F.C.

The King then conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.—Flt. Lt. STANLEY GOBLE, R.N.A.S.

THE MILITARY CROSS.—Lt. ALEC GAVIN, R.F.C.

NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

Dec. 20th.—Sub-Lt (Flt. Lt.).—A. W. Mylne, promoted to Act. Lt., seny. Dec. 15th.

Messrs. R. M. Stirling and H. L. Macro, both entered as Proby. Flt. Officers, seny. respectively Dec. 14th and 15th, and apptd. to "President," addl., for R.N.A.S., Dec. 31st.

Dec. 21st.—The following have been entered as Proby. Flt. Officers (temp.), seny. Dec. 31st, and apptd. to "President," addl., for R.N.A.S.:—J. A. Cole, K. F. Alford, T. H. Herriot, G. H. Herriot, W. M. Davidson, and A. D. Pole.

Dec. 22nd.—Sub-Lts. (Temp. R.N.V.R.).—S. A. Bevington and A. C. Baker, promoted to Lts. (temp., R.N.V.R.), seny. Dec. 18th.

Mr. C. R. Knowles entered as Proby. Flt. Officer (temp.), seny. Dec. 18th.

PERSONAL NOTICES.

ENGAGEMENTS.

CADBURY—FORBES PHILLIPS.—An engagement is announced between Flt. Lt. Egbert Cadbury, D.S.C., R.N.A.S., and Miss Mary Forbes Phillips, daughter of the Rev. C. Forbes Phillips, vicar of Gorleston, and well known as a writer of plays.

Flt. Lt. Cadbury was awarded the Distinguished Service Cross for his successful attack on a Zeppelin in the last raid on Nov. 28th. He is 23 years of age, and is the youngest son of Mr. George Cadbury, head of the firm of Cadbury Brothers (Ltd.), of Bourneville, Birmingham. Miss Forbes Phillips has frequently appeared in her father's plays, and has written many poems and short stories.

* * *

DANE—COOMBE.—A marriage has been arranged between Comdr. Clement Richard Dane, R.N. (Wing Comdr., R.N.A.S.), eldest son of Sir Louis W. Dane, G.C.I.E., C.S.I., I.C.S. (retired), late Lieutenant-Governor, Punjab, India, and Lady Dane, of King's House, Lyndhurst, New Forest, Hants, and Bessie Albinia, only daughter of Dr. and Mrs. T. Sandby Coombe, of St. Werburgh Lodge, Hoo, North Kent.

BIRTH.

WARRINGTON-STRONG.—On Dec. 16th, at 3, Harvard Court, West Hampstead, N.W., the wife of Flt. Lt. F. Warrington-Strong, R.N., of a son.

MILITARY.

G.H.Q. COMMUNIQUE.

DEC. 21st, 10.20 p.m.—The improvement in the weather yesterday led to considerable activity in the air. In the course of the raids carried out by our machines a ton of explosives was dropped on points of military importance behind the enemy's lines.

Much fighting took place in the air. One enemy machine was destroyed, and six others were driven down damaged.

Four of our machines are missing.

WAR OFFICE COMMUNIQUE.

DEC. 20th.—On Dec. 17th, Lt.-Gen. Smuts, reporting the fighting in the vicinity of Kibaba, says:—Our aeroplanes have carried out bombing raids with considerable success, and inflicted appreciable casualties.

Dec. 21st.—The General Officer commanding the British Forces in Mesopotamia reports:—



INQUISITIVE OLD GENT: "Are you doing much flying now?"
AIR MECHANIC: "Rather, we're so busy, that we have no time to come down to meals, they have to bring the food up to us on ladders!"

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During the night of Dec. 17th-18th British aeroplanes successfully bombed the enemy's rivercraft west of Kut-el-Amara.

* * *

THE CASUALTY LIST.

Reported Dec. 20th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Bowen, Lt. E. G. A., R.G.A., att'd. R.F.C.

Dendrino, Sec. Lt. S., R.F.C.

Edwards, Sec. Lt. G., R.F.C.

Godfrey, Sec. Lt. O. C., R.F.C.

Kenny, Lt. J. M. J., A.S.C., att'd. R.F.C.

MISSING.—Hunt, Lt. B. P. G., Yeomanry and R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Knowlden, Sec. Lt. W. E., Border Regt. and R.F.C.

KILLED.—R.F.C. ATT'D. R.G.A.—Buckley, 8839 2nd Cl. Air Mech. D. (Cubitt Town, E.)

DIED OF WOUNDS.—R.F.C.—Lovesey, 15557 2nd Cl. Air Mech. E. (Edmonton, N.)

WOUNDED.—R.F.C.—Birch, 4174 Sgt. S. W. (Edmonton, N.); Gough, 22838 2nd Cl. Air Mech. S. A. (Dalston, N.E.)

R.F.C., ATT'D. R.G.A.—Naphtale, 12325 2nd Cl. Air Mech. H. (Forest Gate, E.)

WOUNDED—SHOCK (SHELL).—R.F.C.—North, 16859 2nd Cl. Air Mech. D. (Tottenham, N.)

Reported Dec. 21st.

WOUNDED.—R.F.C.—Darvell, 524 Sgt. F. E. (St. George's Square, N.W.)

Reported Dec. 22nd.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMAN HANDS.—Johns, Lt. T. M., Welsh Regt. and R.F.C.

PERSONAL NOTICES.

DEATHS.

BROOKE.—Lt. Arthur Goulburn Brooke, R.F.C., accidentally killed on Dec. 10th, was the youngest son of Mr. J. Marsland Brooke, of Childerley Hall, Cambridge. Born in 1892, he was educated at the Leys School, Cambridge, and five years ago went to Canada. On the outbreak of war he returned and enlisted in the Northants Yeomanry. After serving in the trenches for over a year he joined the R.F.C., and got his commission in March.

* * *

MERTON.—On Dec. 20th, at a nursing home, after a short illness, Rena Dury, the wife of Lt. Gerald Merton, R.F.C., and daughter of Mr. and Mrs. Charles Sanders, Fawnlees Hall, Wolsingham.

MARRIAGES.

McCLINTOCK—LAIRD.—On Dec. 20th, Ronald St. Clair, R.F.A. and R.F.C., son of Mr. and Mrs. Arthur McClintock, of Rathvinden, Leighlin Bridge, was married to Mary Gordon, daughter of Mr. and Mrs. John Macgregor Laird, formerly of Birkenhead, at the Church of the Holy Trinity, Kensington Gore, by the Rev. F. H. Coward.

* * *

REYNOLDS—LONGMAN.—On Dec. 14th, Lt. Francis Godfrey Baylie Reynolds, R.F.C., son of Mr. and Mrs. E. L. Reynolds, of "Overliegh," High Wycombe, was married to Doris, daughter of Mr. and Mrs. R. Longman, of the "Lodge," Rectory Avenue, High Wycombe, at St. Martin's-in-the-Fields Church, Trafalgar Square.

* * *

WILKINSON—SNELL.—On Dec. 18th, Capt. Alan Machin Wilkinson, D.S.O., Hampshire Regt. and R.F.C., eldest son of Mr. and Mrs. H. Wall Wilkinson, of Ealing, was married to Lina Rachel, second daughter of Mr. and Mrs. J. A. Snell, of Clifton, Bristol, at St. Barnabas Church, Kensington, by the Rev. Lionel Ford, Headmaster of Harrow, assisted by the Vicar.

ENGAGEMENT.

DARWIN—ROSE.—An engagement is announced between Capt. C. W. W. Darwin, Coldstream Guards and R.F.C., eldest son of Col. and Mrs. Charles Darwin, Elston Hall, Newark, and Dryburn, Durham, and Sibyl, youngest daughter of Mr. and Mrs. Charles Marston Rose, of 22, Hans Place.

FRANCE.

OFFICIAL COMMUNIQUÉS.

Dec. 19th.—On Sunday night two German aeroplanes were brought down by our pilots on the Verdun front. One of the machines fell at Herbébois; the other came crashing to the ground near Ornes.

Last night our bombarding squadrons dropped 600 kilogrammes (over half a ton) of explosives on the railway stations of Dunsur-Meuse and Montmédy, and on bivouacs near Azannes (all on the Verdun front).

Dec. 21st.—On the Somme front four enemy aeroplanes have been brought down by our pilots—the first near Manancourt, the second in our lines in the neighbourhood of Cléry, the third be-

tween 400 and 500 yards from Devise (south of Peronne), and the fourth south of Rouy-le-Grand (south-east of Chaulnes). This last one was brought down by Sous-Lt. Nungesser, which brings the number of enemy machines brought down by this pilot to 21.

Yesterday 48 bombs were dropped on the station of Anizy (north of Soissons). During yesterday evening four of our machines dropped 480 kilogrammes (nearly half a ton) of bombs on the railway station of Brioules-sur-Meuse (north-west of Verdun) and Charleville-Mézières. Between 5.15 and 6.40 11 of our aeroplanes dropped 47 bombs of 120 mm. on the station and the barracks at Nesles, and on the bivouacs, and also on convoys which were on the march.

* * *

It was reported from Paris on Dec. 19th that Capt. de Beauchamp has been killed in an air-fight in the Douaumont region. His machine fell in the French lines.

Though a chef d'escadrille, on the eastern frontier, it was only in September, on the occasion of his flight to Essen, in company with Lieut. Daucourt in a second machine, that his name appeared in the official reports of the Ministry of War, and thus became known to the public in this country.

Next to Sous-Lieut. Marchal's flight over Berlin on June 20th, Capt. de Beauchamp's raid on Essen on Sept. 24th, and his later raid on Munich on Nov. 17th, are the longest flights of the war. The journey to Essen and back involved a flight of 500 miles; that to Munich and thence to Santa Dona di Piave, Italy, where Capt. de Beauchamp landed, 437½ miles. When Marchal was obliged to land at Chelm, in Poland, after he had flown over Berlin, he had travelled 811 miles, flying mostly in the dark.

GERMANY.

G.H.Q. COMMUNIQUÉ.

Dec. 21st.—WESTERN FRONT.—During numerous aerial fights, and as the result of our anti-aircraft fire, the enemy suffered the loss of six aeroplanes in the Somme region.

RUSSIA.

OFFICIAL COMMUNIQUÉS.

Dec. 20th.—On Dec. 16th an enemy seaplane, protected by a battleplane, dropped bombs without success upon Sulina (at the mouth of the Danube). The battleplane was hit by one of our



(Reproduced by courtesy of "La Guerre Aérienne.")

The late Capitaine de Beauchamp.



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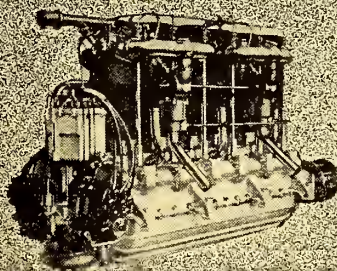


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AERO ENGINE

aviators, named Ragozyn, and fell into the sea. In consequence of the cold weather we were unable to capture it.

(According to the Reuter version of the Russian communiqué, the seaplane which dropped bombs on Sulina was "escorted by a destroyer," and it was the seaplane that was hit.)

ITALY.

OFFICIAL COMMUNIQUÉS.

Dec. 19th.—Hostile aircraft dropped bombs in the Upper Cordevole Valley and on Auronza (Anziei Valley), where one of our hospitals was hit. Some people were wounded. The damage is slight.

Dec. 21st.—Yesterday along the whole front, the weather being fine, artillery and aircraft were more active.

ON THE TRENTINO FRONT.—Enemy aircraft attempted raids over our lines, but were in all cases driven off by the fire of anti-aircraft batteries.

Our aeroplanes bombed the railway station of Dorimberga (Dornberg, on the line from Gorizia to Trieste), in the Frigido (Vippacco) valley, and the rear of the enemy lines on the Carso. Notwithstanding the fire of numerous batteries, all our machines returned safely.

SWITZERLAND.

An officer of Zeppelin L15, which was brought down in the Thames on the night of March 31st, was among a party of German officers sent from Donnington Hall to Switzerland in exchange for British officers.

MESOPOTAMIA.

The following extracts from the report from Mr. Edmund Candler in Mesopotamia are worthy of note:—

Up in the air one loses the mirage. Immediately you leave the ground things cease to be blurred. The eye in the air is nowhere so essential as in the desert, where all objects conspire in illusion.

I heard a subaltern observer describing an action early in the campaign when he was in the only machine available at that particular time and place, and he had no wireless. The whole thing seemed so simple and easy from his perch in the air. He could see our own cavalry and the enemy's approaching each other in the haze, neither having any idea of the other's existence. He felt that he could turn the tide of battle, or rather turn an inconclusive engagement into a big coup, if only he could make himself heard. But down below everything was obscured in mirage, and so we may have missed a chance.

But that was in an early phase of the show. We have had time to make good in the air since then in man-power, machine-power, staff, and material. Our ascendancy in the air is as complete here as in France.

The closest touch has been established between artillery commanders and pilots and observers, with damaging effect to the enemy's guns. Air photography, as a means of charting a hostile and unsurveyed country, has been brought to a scientific pitch. Aerodromes have reduced the wastage of our machines, which in the earlier days warped and shrank in the alternate rain and sun. By constant bombing raids, especially at night, we have established an aggressive offensive. The result of fights in the air has been that a week often passes without a sight of a hostile aeroplane.

Low flying, no easy thing in the dark, has become the rule of late. In a raid at Shumran the other night one of our machines was hit by splinters from its own bomb.

Effective machine-gun fire near the ground, in co-operation with our cavalry, has been the most remarkable development in the air. Our aeroplanes have become the terror of thieves, raiders, and irregular horse. It is impossible for them to get off with their loot in the morning. Our machines, flying a few feet above ground, scour the whole desert, rake their hiding places with machine-gun fire, scatter and pursue their cavalry, spreading panic among their horses, and round up the retreating convoys, while our cavalry follow up and bring back the spoil. Such was the result of an attempt to raid our camel transport at Sheikh Saad.

A country where the elements are so perverse as they are in Mesopotamia must have its air disabilities. At different altitudes you meet currents blowing in contrary directions, and the change as you pass from one into the other makes very bumpy flying.

Though the wind currents over the desert are eccentric, the Shamal, or north wind, blows at some level or other all through the year. If it is not blowing on the ground you will strike it in your machine if you go high enough.

In the hot weather the conditions for flying are very trying. At night and in the early morning the air at 500 ft. is far hotter than on the ground, and it becomes hotter and hotter until you reach 3,500 ft. You must go up 6,000 ft. before you begin to feel cool. The intense heat thins the oil; you can never run your motor full out or it will get red-hot. You lose 20 h.p. at a temperature of 115 deg. Long flights are impossible. After 9 a.m. the heat makes conditions most adverse for flying, and there is nothing to be done in the evening. The wood warps

and shrinks in the sun. New machines have to be re-rigged when they come out, and the dust chokes the engines. The sand rises in clouds and blows as high as 4,000 ft.

During the last rainy season mud sometimes put our machines out of action. After a single day's rain at Oran a 90 h.p. engine and eight men could not move an aeroplane in the driest part of the aerodrome in the driest part of the camp.

Then there are the floods. An aeroplane at Kurna or Nasiriyeh between April and July has the same difficulty in finding a dry spot as Noah's dove. And it is much easier to land than to get away. At the beginning of the campaign, when we were operating in country where the tribesmen were in the pay of the Turks, the landing difficulty increased the odds against our aviators. An aviator who went up to Nasiriyeh in July, 1915, had to land in an inundated area. He was able to bring his machine down in the flooded water on the friendly side of the river. He escaped with his revolver and rations as the Arabs on the other bank made for the machine, firing at it. As they were looting the machine friendly Arabs opened fire on them and scattered them, and the aeroplane was recovered intact.

During the return from Nasiriyeh two machines had to come to ground; one alighted near Khamisiyeh. It was just after the defeat of the Turks, and a responsible Sheikh received the pilot and entertained him hospitably. The other machine came down the same day within 15 miles, but it fell amongst defeated and retreating auxiliaries, who were in no mood to give quarter. Both pilot and observer were killed.

[This presumably refers to the deaths of Lieuts. Burn and Merz, of the Australian F.C.—Ed.]

Now we are having things very much our own way, though the enemy have brought out some good machines, fine fliers, and gallant men. Their two Fokkers disappeared after a fight with our aviators on August 13, and have not been seen since. One landed well within the Turkish lines; the other on rough ground by the Tigris bank, where it was broken up by our gun fire. Since this our machines have carried out their work unmolested.

One of our pilots made a great sensation in the Turkish camp the other day when he looped the loop and cart-wheeled over Kut in contempt of their "Archibalds." Prisoners tell us that this derisive little bit of bravado impressed our friends immensely.

Chaff is exchanged freely between the rival Flying Corps. Many of the enemy pilots are Germans, but even the Hun can become a gentleman in the air. His nature seems to improve with the element he frequents. Most gross on earth, less gross at sea, least gross in the clouds. Apparently altitude purges and refines, or it may be that the finished clod does not take to the air in the beginning. A 100 lb. bomb or a drum of machine-gun bullets are a better currency than chaff, but our air scrapping is none the less formidable for the high spirits in which the Flying Corps goes into action.

Smith inquires of Schultz: "Why don't you use the aeroplane we left you at Kut? Can drop you spare parts if they are any use." It was a mere shell of a machine, and information had come through that they were trying to put a German engine in it.

"Go on dropping bombs on our aeroplane," Schultz retorts; "it is from 800 to 900 metres high, and you haven't done any damage yet. By the way, we have a machine that will strafe you, born of an English mother by a German father (engine), an improved 1916 type." Hence its barbarous hum (barbarische Hummen).

The English illustrated papers, when they contain anything which may penetrate the Hun epidermis, are dropped on their aeroplanes. "Simplicissimus" and "Jugend" rain upon ours.

WARNING.

The Army Council warns the public against approaching, examining, or handling explosives, such as bombs or darts, which may sometimes be accidentally dropped from aircraft during practice or may be scattered through the accidental fall of aircraft.

Should injuries be suffered by any person through approaching, examining, or handling such explosives, or any other explosives used experimentally or for the training of troops, the Council will not be prepared to pay any compensation.

Persons finding objects of this nature should at once report the matter to the nearest military or police station.

A WAR WEDDING.

The marriage of Mr. Claude Grahame-White to Miss Ethel Levey, the revue actress, took place on Dec. 21st at the St. Mary-lebone Registry Office.

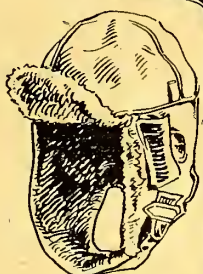
Mr. Grahame-White, who was born in 1879, for a time held the rank of Flt. Comdr. in the R.N.A.S. He resigned his commission to superintend the building of aeroplanes for the Government. Miss Levey is appearing with Mr. Harry Lauder in "Three Cheers," the new revue at the Shaftesbury Theatre.

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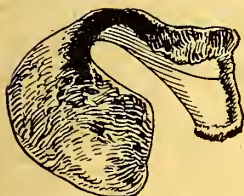
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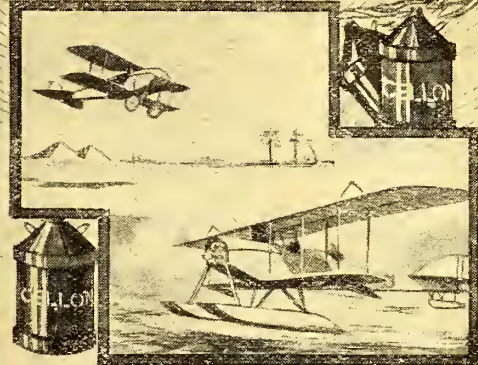
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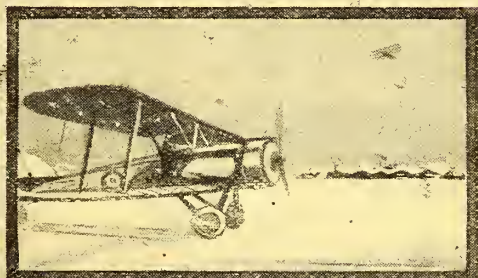
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SOME AERO-INDUSTRIAL PROSPECTS.

BY GEOFFREY DE HOLDEN-STONE.

"... Though I won it from the desert. You go up and occupy."

Certain aero-munition contractors of much good fortune, but little faith and no great imagination, are beginning to wonder what the outlook for their new trade is going to be after the war. So they are refraining, in their unwise cautiousness, from preparing adequately for peace. One hears of extensions "under consideration," in the best manner of the late Coalition—invariably late—but still in suspense, though their fulfilment is really vital; of plant—and not only of the time-saving kind, but of the merely productive—left unordered; and of a general lack of programme.

These dear good souls are actually waiting, in effect, for an assured demand to manifest itself, apart from Government contracts, before considering, much less organising, its supply!

They seem never to have heard of the excellent American idea—upon which nine-tenths of American manufacturing industry is run—that the offered supply suggests and creates the demand. The real rock-bound or cave-man truth—which we are wise enough to ignore—is that nobody really wants anything! But neither man nor nation that gazes too long on that fatal truth will ever have any business or any industrial existence.

For instance, twenty-five years ago, who wanted a motor-car, cheap or dear? The parvenu's toy. If you could have offered either a limousine or a hundred-pound runabout, as made to-day, they would have had neither at a gift. Is it for nothing that a chauffeur means no more or no less than a stoker? As one would have been told. And was, even twenty years ago. But then that all-wise public jester, the Press, got hold of the automobile idea, looked up its tragic past, and out of an almost hopeless present literally wrote it into its brilliant future that begins to-day. For who to-day will be without a car? Without motor-transport, we Allies had no earthly hope to beat Germany and her strategic railways.

Not sixteen years ago, one of the greatest industrial scientists who ever lived, a man of the most liberal and receptive mind, publicly declared that heavier-than-air flight was not only impossible, but its endeavour a futility. About that time, the U.S. Patent Office refused to grant the original aeroplane design a patent, alleging that it was inoperative without a balloon. To-day, aeroplanes are the eyes of legions, gazing over provinces between dawn and noon. Which result did not all come of the problem of the unsold vintages of Reims. But of trial and use, got by sheer endeavour out of imagination.

Nevertheless, the same generation of toe-dippers are cautiously, ruefully doubting that there will be any worth-while aero-industry after the war. Which is as if they argued that nothing like an A.S.C. motor-wagon could ever be of much use except for military transport; or that a little boy could not grow into a navy.

The fact is, that while truth is always truth, Providence deals it out in assorted sizes, according to our capacity. The largest, then, for ours. One of the larger truths is that need follows suggestion. Choosing your audience well, according to your project—it is no use trying to sell silk stockings to an Esquimaux—you have only to tell anybody that he needs anything firmly, not more than six times, then let him find out that you have it, and he will climb all over the morning hills to get it from your store. Or his wife will never forgive him.

These things do not spell civilisation, of course, nor

even progress always. But they are the tools of both, nevertheless, that they may well shape their shields.

Now, all such ethical questions apart, this nation of the most patient, easy, law-ridden, law-abiding, unordered, magnificent fools that ever lived has had its greatest lesson since the Spanish Armada caught Drake and Frobisher short of munitions because the House of Cecil, then in power, grudged the money, in spite of a Stanley's, a Howard's advice. When, likewise, the enthroned wit of Wales was a name to conjure and drive, more than a force to execute. [N.B.—Queen Elizabeth was a Tudor.—Ed.]

But, then, the seed of Empire was hardly sown upon the seas. To-day it is grown and harvested home from all the outlands. Yesterday only, we who sat fatly at home, eating cheap bread on credit, could not see and would not hear. Any disturbing voice must be stifled because it disturbed:—

And our talking-men spoke smooth things, soft delusions in the ears of a cheated people, at Mammon's command; and laughed at the ease of the cheat and changed it anew.

Until... at the thunder of war we half-wakened; and wondered two years while half of the best that we bred died terribly, daily, to prove it a cheat, though we dreamed it was true.

But now we have fully awoken at last—and though risen not yet to the strength of which half is untold—to know it a cheat, for ourselves and the rest of our blood that he left to come after, the heirs of an Empire, war-shriven, new-souled.

So to-day, with our lesson so learnt, so burnt into our skulls that we cannot forget, we are seeing to this, above all, that in future we govern ourselves and our own, as most fits for the greater we are, and the lesser we rule.

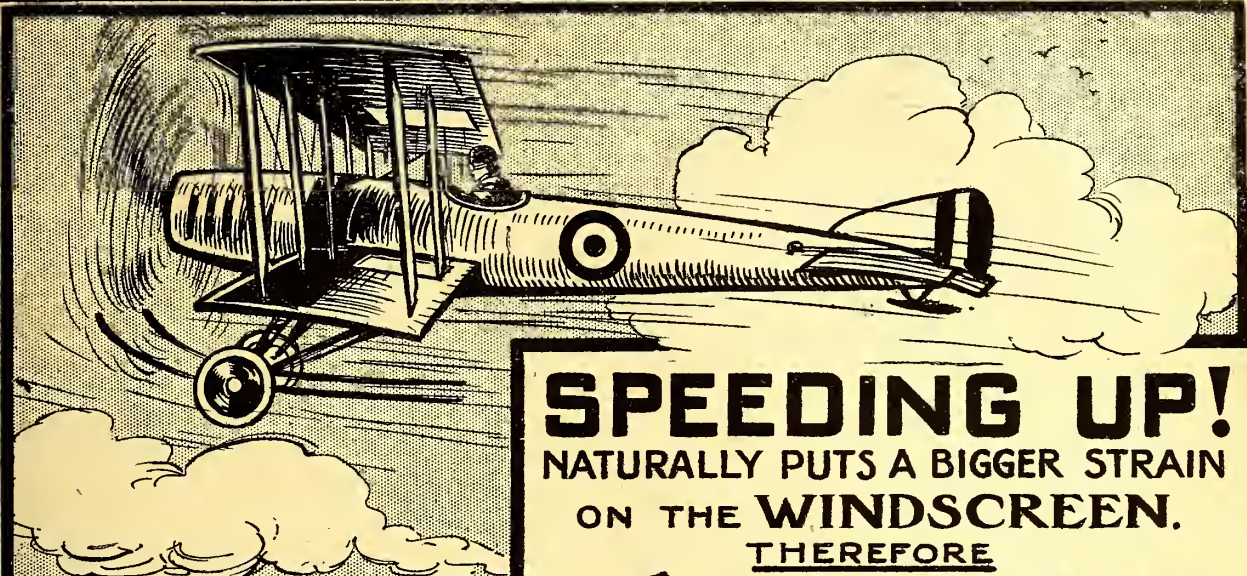
And those that we choose from amongst us, whose hands we shall strengthen, if yet they refuse in their weakness to govern and guide us, in a day or a night they shall go, giving place to their betters that can; and fare well if they go as they came while our temper is cool.

Not again shall a Haldane delude, or his lackey refuse the sheer gift of an urgent defence, and demand that its cost should be spent on the purchase of lands that without it were useless and nakedly open to alien spies.

Not again, while we and our children awake and remember to whither and what—and how nearly—they led us and our women, our homes and that all which is England, believing their lies.

Not again, nor yet ever, while England remains; for with them and their like we forever have done; while grass grows and the salt tides shall run to the ends of our Empire and our crosses be flung to the outermost skies.

That is why there must always be a British aero-industry after this war. Though peace were declared in Europe for a hundred years to come, under penalty of devastation by the rest for the nation that broke it. If only to guard every mile of our own coasts, watchfully, threatening none. If only because, though we may know our own mind, we can neither foresee, know, nor govern the mood of our friends, for a day or a year. If only because, though all Europe were one federation, and one agreed civilisation, no longer can Russia be its bulwark, because there are no more Altai's under open air to fence her against an awakening East. If only because in and by the air alone can we police, far-off and



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prepared, the coasts of our empty lands overseas, until they be filled; and our right of possession be established before the whole world, by occupation and use.

Right is might, and so to be. For what else are we fighting? But mere possession constitutes no such rights in the chancelleries of world-civilisation. We rule and possess India and every part of our Empire, not by right of conquest or prior arrival, but because we have created and taken up the white man's burden of kindly rule and use for good and the preservation of the lesser peoples. Whereas the German nickel-plated idea of Empire has been run on mere exploitation to be followed by extermination.

Civilisation, again, is not a question of colour. There are others. But we believe the Caucasian white man's kind to be the best, for our subjects as well as ourselves. In years to come, other civilisations of other ethics may disagree.

For which fundamental reason alone, there must always be a huge State-constituted and State assured demand for an aero-industry, in every part of our Empire; State control or operation being a matter of local detail and conditional arrangement, chiefly.

By itself a stupendous prospect. But as policing and soldiering are only a small part of the world's work, it is small compared to the outlook in civil and social capacities. There are mails to be carried; perpetual intimate communications, internal and external, to be established and maintained with orderly speed; inspections, transactions, journeyings to be made over wide distances. The obstacle, physical, geographical, must be overcome; how much more easily overflowed, so that it ceases to be an obstacle? We cannot wait to drill tunnels and bridge chasms to our empires.

Nevertheless, it is a fact that, solely because of physical obstacles, at least a quarter of the habitable earth—

as isothermically ascertained—remains unexplored and largely unpeopled. And it is no mere legend of the fiction and travel magazines that some of the most fertile lands, the richest mineral deposits, are so surrounded by deserts or inaccessible cliffs as to be impregnable to the pioneer and prospector. Much has been done by sheer endurance and a little timely luck. In Australia, for instance—where these conditions notably exist—there are sheep-runs two hundred miles beyond where—to my very personal knowledge—was "farthest west" twenty years ago. And to-day the motor-car takes us readily beyond the older limit of human or animal endurance.

But where the car stops defeated, the aeroplane can go on three hundred miles and return. Even to-day's crude creation. From its nacelle, what treasured secret of earth is there that can be hidden or withheld? And having once found it, and the way thither and back, direct by compass and chronometer through the air, we can wait for the assured earthway to come later by no speculative chance, but as a certified project to a known result.

So it comes to this, that the conquest of the air is only, and the only, way to the conquest of the earth and the fullness thereof.

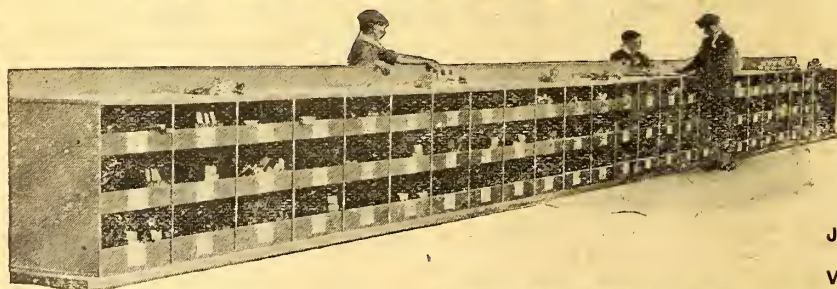
What a prospect! And the beauty of it is that neither the development nor the obsolescence of type affects any of these contentions as to the certain permanence of aerial locomotion, and the need of its material. To-day we have aeroplanes so different from those of only five years ago as to be nearly a new technical proposition. Yet like enough to be the same in essentials. We are still proving, as much backwards as forwards, upon similar incidences, force centres, and aero-curves as before, with as much mathematical as practical experiment; so that there is as much room as ever for the original discovery that will—indeed has—not so much falsify these things as put them out of date.

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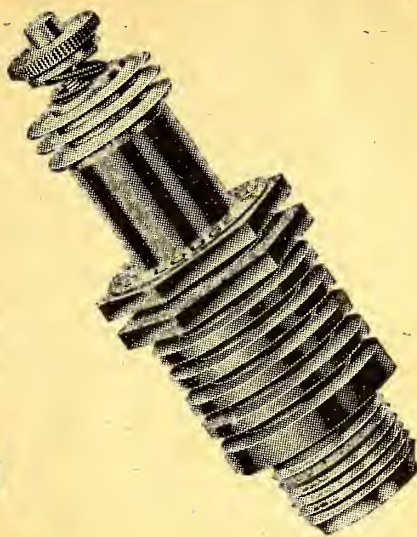
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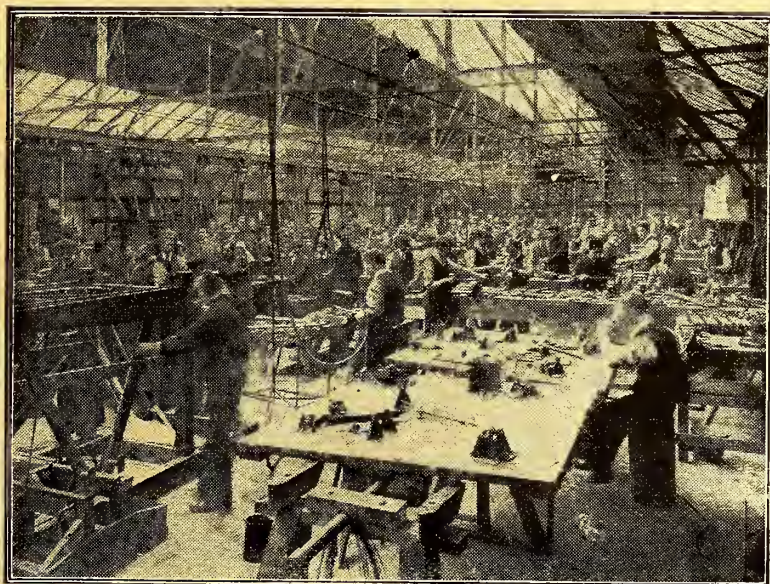
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But as all alike, and all things appertaining thereto, call for material, construction, and supply, what else constitutes an aero-industry? Was there ever one so great offered to the human brain and hand?

A SPEED CONUNDRUM.

A puzzle which appeared in THE AEROPLANE of December 13th has apparently produced considerable interest. The original note read as follows:—

G. A. C. (Kent) sends the following horrible conundrum:—

"Two aeroplanes are travelling at a continuous rate of 2,000 ft. per second in a direct line in the same direction. They are at a distance of 500 ft. apart. The pilot in the rear aeroplane has a rifle with a muzzle velocity of 2,000 ft. per second.

"Assuming that the pilot is a dead and true shot, would he be able to hit the pilot in the leading aeroplane, and, if so, how many seconds will elapse before the object is hit? Please give reasons, it in the affirmative."

The Editorial reply read thus:—

First of all, a speed of 2,000 ft. a second means approximately 1,300 m.p.h., so that the assumption that there are two aeroplanes travelling at 2,000 ft. per second may be washed out.

However, leaving the speeds of the aeroplanes themselves out of the question, there does not seem to be the slightest reason why the gunner in the rear aeroplane should not hit the pilot in the leading one, provided that the leading aeroplane is not a "pusher"—in which case he would probably hit the engine instead of the pilot.

The muzzle velocity of the gun is only affected by the speed

of the aeroplane to the extent that the speed of the aeroplane through the air is added to the muzzle velocity of the bullet, and, therefore, the head-resistance of the bullet is increased by that amount. For instance, a machine travelling at 100 m.p.h. is doing roughly 150 ft. per second, so that a bullet leaving the muzzle of a rifle or machine-gun with a speed of, say, 2,000 ft. per second would actually be travelling through the air at 2,150 ft. per second. Its actual range over the ground would, therefore, be increased to some slight extent.

As the other aeroplane is supposed to be flying at the same speed as the one from which the bullet is fired, that additional velocity would not affect the time which the bullet would take to reach its objective, and it is just possible that the extra head-resistance caused by the extra speed through the air might slightly increase the time which the bullet would take to overtake the leading machine.

This is rather a pretty question for experts in ballistics to work out. Perhaps someone would oblige.

This has produced the following letter from Mr. G. B. Petter, of Yeovil:—

"Sir,—The question asked by G. A. C. (Kent) is an interesting one in spite of the conditions stated being impossible to realise in the present state of the art.

"The rifle bullet would have a muzzle velocity relative to the earth of 4,000 feet per second, and the air resistance would be very great. I estimate that the bullet would lose 1,500 feet of travel in the first second, and would cover a distance of 2,500 feet, which would bring it exactly to the position occupied by the front aeroplane at the same moment.

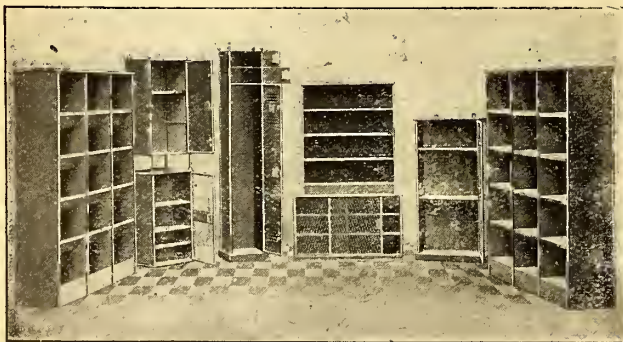
"The aim being perfect, the bullet would just manage to get inside the 'object's' collar, and rickle down his back. That is to say, at low altitudes; higher up it would give him a nasty jar.

"In the second problem the flying speed is 150 feet per second, and neglecting air resistance the bullet would reach its mark in a quarter of a second after having travelled 537½ feet.

"Air resistance would only prolong the victim's life by 1-40th of a second, and give him four feet of extra flying. At higher altitudes this further lease of life would be much curtailed."

Following this came a humorous effort, on official paper, as reproduced hereafter:—

"With reference to 'Answers to Correspondence,' Dec. 13th, G. A. C. (Kent). The question is one of the utmost importance with regard to obtaining command of the air; and any help towards getting one up on the Hun before he has solved this problem should be most gratefully received (Ed. please note).



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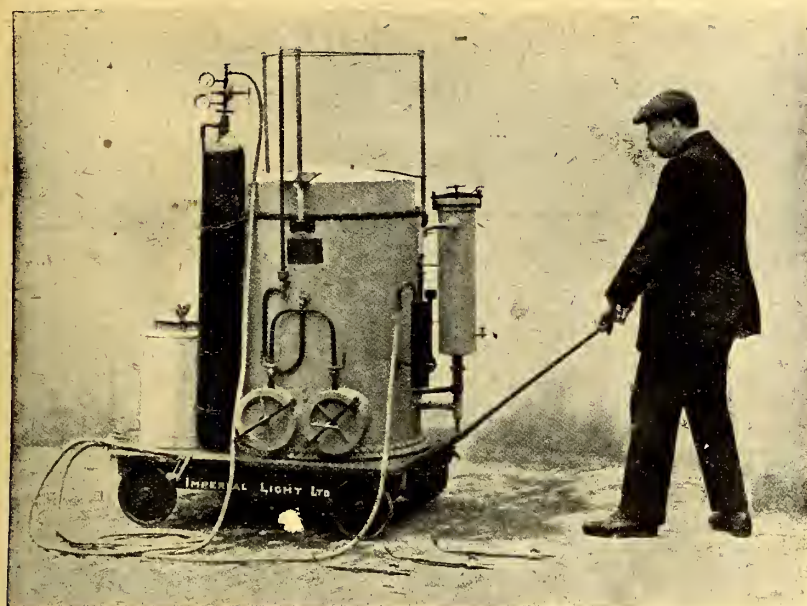
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"The assistance of one of our most up-to-date 'Movie' Merchants was obtained, as I realised that photography cannot lie.

"The Movie Merchant was quick to grasp the problem and chartered the services of an express train and several gentlemen of the ring. The latter were put through a course of training to ensure that their left straights from the shoulder always attained a velocity of precisely 60 m.p.h., and no more.

"Some weeks were spent at this, and a good many casualties occurred owing to the gentlemen not having the ballistic spirit. Eventually all was ready. Movie operators (fully badged) principals, seconds, doctors and Press correspondents assembled on the roof of the express, which was guaranteed to run exactly 60 m.p.h.

"Your correspondent, having initiated the experiment, thought it wiser to attend to an urgent call to the bedside of an aged aunt.

"The following day, the film having been developed and used as evidence at the inquest, your correspondent was arrested as accessory before the fact on a charge of murder.

"It appeared in evidence that the gentleman in front had stood with his hands down while the gentleman at the back (of the train, of course) launched his 60 m.p.h. straight left to the point, doing in the front gentleman for good.

"This has since seemed to me to be conclusive ballistic evidence that the rear man can hit the front one; and though the Judge was kind enough to remark that 'I appeared to be too old to be so silly,' my address shows the conclusion he really came to.—Yours lunaticly, R. A. C. (Censored) Asylum."

Now which is right? Apparently our amiable lunatic has entirely omitted calculations for added air resistance.

A COMMENT ON TWO AND A HALF YEARS' AVIATION.

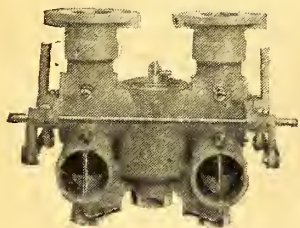
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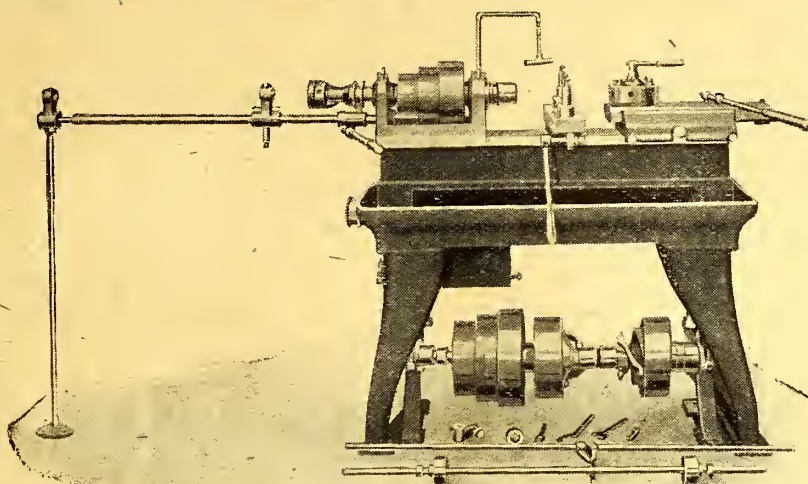
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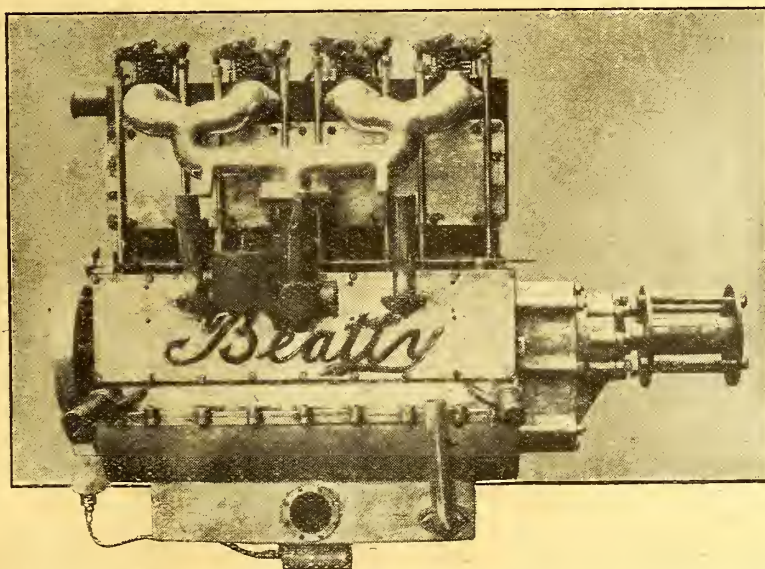
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

The query still follows the row of war years, and final views should only be premature, but the adding of 1917 to 1914-1915-1916 justifies to look behind, before the conditions upon the outbreak of war disappear in dimmy forgetfulness, as their consideration—state of affairs just prior to and on the start of war—counts much in later development. Views can naturally only be taken on big lines, which means to confine to E, F, and G, England taking thus by alphabetic order first place.

An early effort of standardising by an official establishment, or said in other words, its effort to keep the aviation child away from the educating communion of trade people had stagnated the child, which was small by birth and growth owing to rather little attention paid to its food question; yet by a sound constitution at bottom, and a distinct sport nature shown it would no doubt have grown up a respectable member of the influential British engineering family, which opinion was justified by its good entrance in the international world among the upper ten at Monaco.

Poor trade relations had out of small means made it some fine "scout" playthings—playthings of the right sort, that combine pleasure with benefit—and a true servant had presented its father with some alphabetic work for it.

Yet war broke out, and the youth had at early age to make headway in life. To speak of the survival of the fittest would probably be more than one could back up, leaving this opinion better for higher powers to decide; but at any rate his sporting instinct helped the boy far, where a more philosophic nature might have despaired, and step by step he has fought his way.

The French got their child an American playmate in the first years for mutual advantage, and the enthusiastic education attracted the world's best sportsmen, from whose company the child benefited, but, too, had the sporting side specially fostered. French by mind, the child did not show organisation as its strong side, and thus when war broke out, and it found itself up against an earnest opponent, the weapon equipment was not the best it might be.

The Morane-Saulnier monoplane was, though a good sporting cross-country flier, only a weapon of attack in the hands of skilled pilots, the Blériot monoplane was highly aeronautically developed, yet slow, and while sharing the latter defect the Henry and Maurice Farman biplanes possessed good climbing and load-carrying qualities and really were what France relied on early in the war.

When journalists asked all over the world's Press at that time: "Why French aviators did not be more active?" they only proved not to know about which they wrote, and those

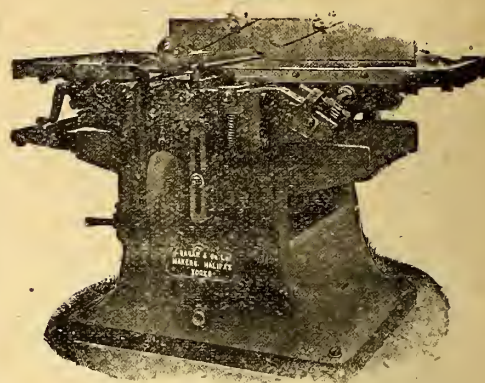
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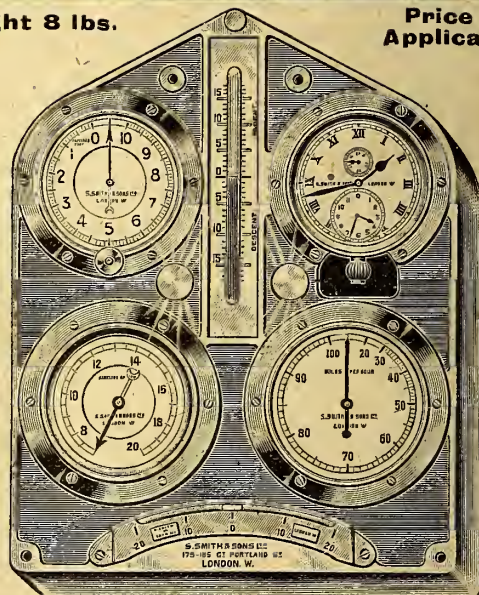
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of knowledge expected to hear news some day. They came, the French youth turned good; its good education and knowledge gained allowed it, pressed by necessity, to turn out material, which it suffices to mention by names as: Voisin, 2-engine Caudron, Nieuport and Spad.

The Germans had spent a long time in breeding a pet called aeronautics, so they adopted an aviation child, which partly had a French nurse and partly turned the good quality of automatic stability to account from Austrian acquaintances, cleverly seeing it in "arrow" and "dove" forms.

In the aviation exhibition at Berlin Germany showed her cleverness in copying foreign patterns, and in the international exhibition to have been held in November, 1914, at Berlin, would have proved that she had now to go abroad no longer to learn anything of aviation. Clever policy in spending a national aviation fund had worked wonders in a short time, and thus, when the war started, the Germans had both efficient aeroplanes and pilots, and, moreover, had them in quantities. The dove patents having been dropped in Germany upon a quarrel between their patentee, Mr. Igo Etrich, and his German licensee, E. Rumpler.

The chance so easily offered had perhaps been too generally responded by almost every aircraft works, for the "Taubes" proved soon too slow for active service, though they continued to be easy nomenclature of daily paper journalists for German aircraft. Yet some firms, like the L.V.G., Albatros, D.F.W., and Aviatik companies had adopted the more or less arrow type, 100-h.p. or 150-h.p. engined tractor biplane, which comprises to-day the bulk of German army aeroplanes.

And about the Fokker campaign is to be said, that as Mynherr Fokker had turned his fuselage and chassis modified Morane monoplane out in Spring, 1914, for looping, when its climbing capacity was highly commented on, it is rather astonishing, taking German organisation into consideration, that not till October of 1915 did Fokkers appear in quantities, which were their main feature, when quantity was not the word on the Allied side.

There is nothing to justify saying that German aeroplane design should, not during the war have kept pace with development, whereas, if German aviation has again lost some of its ground gained, the reason is sooner to be found in difficulties of finding still quantities of quality pilots now that the original pre-war breed has partly gone, as in every arm and army.

However, this war has still to be won, or to speak strictly neutrally and cautiously, to be ended, to arrive only at the

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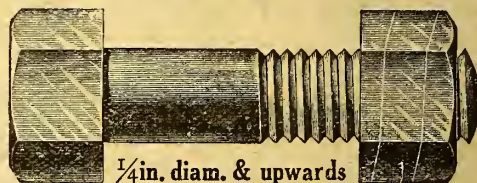
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final result: paying in form of taxes for the experiences gained. Taxes can only be taken where there are income, and there is no need to tell Germany, the land of organisation, the importance of catering for after-war trade.

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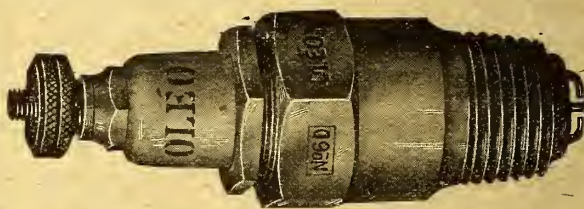
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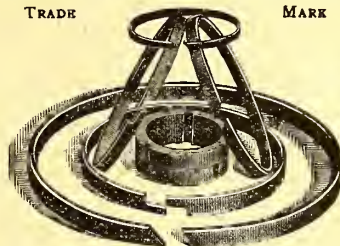
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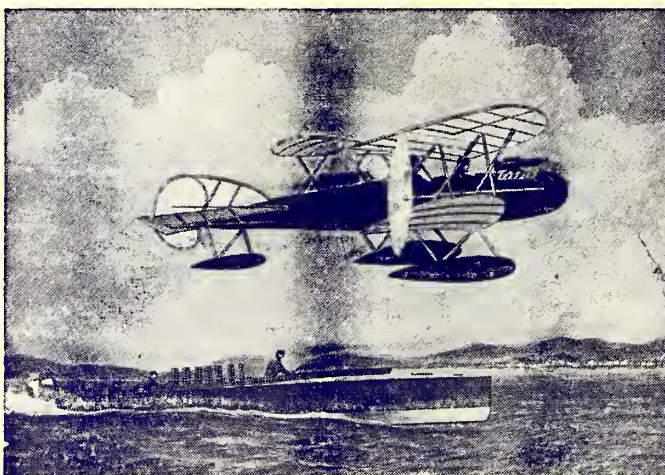
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